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CONTENTS

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RESEARCH NOTES

FROM THE EDITOR

It is a pleasure to announce the appointment of Michael A. Hitt, Texas A&M University, as Associate Editor of the *Journal*. Mike will become Editor on January 1, 1991.

Mike has done an outstanding job as Consulting Editor the past few years and before that as a member of the editorial review board. He has been a tremendous help to me and to the authors of papers in revision. Mike is conscientious, fair, and dedicated, traits that will serve him well as he assumes expanded duties. The *Journal* will flourish under his editorship because Mike is committed to standards of high quality in published research and to providing contributors with timely and comprehensive feedback on their work.

To ease the transition between editors, Mike will begin receiving new submissions on July 15, 1990. New submissions prior to that date should be sent to me at the University of Oregon. In addition, I will continue to handle all papers under revision until the end of my term as editor on December 31, 1990.

The Academy is fortunate to have a colleague of Mike's caliber who is willing to take on the responsibilities of the editorship. I hope that you will extend to him the same support and hard work as reviewers that I have enjoyed. More important, I hope you will continue to see the *Academy of Management Journal* as among the most important publication outlets for empirical research on management. The consulting editors and editorial review board members work very hard to provide contributors with timely and comprehensive feedback as one way to encourage your submissions.

RTM

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EVOLVING INTERPRETATIONS AS A CHANGE UNFOLDS: HOW MANAGERS CONSTRUE KEY ORGANIZATIONAL EVENTS

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The purpose of this research was to develop a model of how managers construe organizational events as a change unfolds. The model, built from in-depth interviews with 40 managers, suggests that interpretations of key events unfold in four stages—anticipation, confirmation, culmination, and aftermath—linked to the process of change. The construed reality and interpretive tasks at each stage as well as the triggers that impel managers to move from one stage to another are described. Implications for organizational research and the management of change are discussed.

Organizations confront a myriad of events to which they must respond. Traditionally, researchers have viewed organizations' responses to events as entailing specific organizational and managerial actions or activities (Van de Ven, 1980a). Recently, however, a growing movement to the analysis of the cognitive side of organizational life has brought into focus the interpretive processes associated with organizational phenomena (Daft & Weick, 1984; Pfeffer, 1981; Pondy, Frost, Morgan, & Dandridge, 1983; Pondy & Mitroff, 1979). Increasingly, the study of this dimension is gathering momentum in both theoretical and practitioner-oriented works (e.g., Ford & Baccus, 1987; Isabella & Ornstein, 1988) as a complement to the study of the issues and relationships brought out by traditional approaches.

Among the most challenging events to which organizations must respond are those that become the contexts for substantial change and adaptation. These events are rarely static or contained within a discrete time frame. Unfolding over time, they demand continual adjustment and present unending challenge for all concerned. Mergers and acquisitions (Katz & Kahn, 1978; Marks & Mirvis, 1986; Sales & Mirvis, 1984), leadership successions (Sonnenfeld, 1988), and organizational deaths (Harris & Sutton, 1986; Sutton, 1987) are examples of recently researched events composed of a complex set of individual and organizational changes. Although many studies have elaborated upon the concrete and observable behaviors and actions

connected with these changes, few have tried to identify and understand the interpretations and cognitions associated with them. The purpose of this research, therefore, was to further investigate the interpretive side of organizational change.

INTERPRETATION AND THE PROCESS OF CHANGE

Organizational Change Research

Within the literature on organizational change, there has been considerable research on the sequence of activities that facilitates the process of change (Delbecq & Van de Ven, 1971; Hage & Aiken, 1970; Lewin, 1947; Lippitt, Watson, & Westley, 1958). Although change at its most basic level has been said to consist of unfreezing, moving, and refreezing (Lewin, 1947), movement through these stages involves more than sequential activities and behaviors. Recent research on selected changes (e.g., Bartunek, 1984; Gephart, 1984; Sutton, 1987) and the literature on organizational change in general[1] have suggested that a substantial amount of cognition and interpretation accompanies the process of change:

> Transitions are themselves transitional. As they evolve, different emphases on a different combination of values and assumptions may be required. When a change is initiated, existing patterns are disrupted and this results in a period of uncertainty and conflict. If key people accept and support the change, novelty turns to confirmation and eventually the innovation is routinized. As the process unfolds, managers are required to take on different orientations and styles (Quinn & Kimberly, 1984: 303).

In other words, as a change unfolds, different assumptions and orientations are required at different times in the process. Managers involved in a change need to undergo an alteration of their cognitive structure (Benne, 1976) that facilitates and supports the need to change, the process of changing, and the maintenance of what has been changed. The frame of reference—the perspective through which people view an event—shifts (McCall, 1977; Starbuck, 1976).

The precise nature of these different and changing managerial cognitions and interpretations, however, has yet to be fully explicated. Although researchers have suspected that cognitions shift, no one has revealed a pattern associated with the change process. Some authors have suggested that understanding the cognitive basis for responding to change would enhance the effectiveness of organizational responses (e.g., Gioia, 1986b).

The Contribution of the Interpretive Literature

Understanding the cognitive basis for responding to change requires understanding interpretation and interpretive phenomena. To date, studies

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[1] Van de Ven (1980a) provides a review of this body of research.

concerned with those issues have aligned roughly into two groups, each with a different and distinctive interpretive thrust. Most interpretive work has examined interpretations in light of theory-driven cognitive constructs, with an emphasis on imposing order on past and present actions (e.g., Ford & Baccus, 1987). Some of these studies have contributed to knowledge about cognitive fundamentals like pattern recognition, attention, and recall that begin the process through which people label and attend to salient information (Cantor & Mischel, 1979; Nisbett & Ross, 1980; Taylor & Crocker, 1981; Taylor & Fiske, 1978; Wyer & Srull, 1984). Other studies, primarily those of organizational theorists, have actually examined the order and structure of specific interpretations through cognitive maps, prototypes, and scripts (Blackburn & Cummings, 1982; Bougon, Weick, & Binkhorst, 1977; Jolly, Reynolds, & Slocum, 1988; Lord, Foti, & DeVader, 1984; Walker, 1985; Walton, 1986). The strength of cognitive theory research has been its articulation of the structural properties of interpretations (Walsh, Henderson, & Deighton, 1988).

In creating structural snapshots, however, those studies have often neglected the temporal dimension of interpretation (Ranson, Hinings, & Greenwood, 1980). Recently, a few studies have examined interpretations over time, identifying not structural properties but similarities in points of view (Gephart, 1984) or construed realities (Sutton, 1987) that guide the attribution of meaning and significance to specific organizational events. In this stream of research, interpretation is defined not as imposing structure but as translating events and developing frameworks for understanding (Daft & Weick, 1984). These researchers have focused on identifying the cognitive logic (Silverman, 1970) threading through the understanding of a particular situation. The strength of the interpretive stream of research has been the articulation of organizational members' collective viewpoints on particular organizational occurrences.

Interpretive Assumptions

Interpretive studies draw on a number of critical assumptions. The first is that organizational members actively create, or enact, the reality they inhabit (Berger & Luckmann, 1966; Weick, 1979). They create a "material and symbolic record" (Smircich & Stubbart, 1985: 726) upon which they predicate future action (Silverman, 1970).

A second assumption is that frames of reference that individual members can share exist within a collectivity (Axelrod, 1976; Bettenhausen & Murnighan, 1985; Bougon, Weick, & Binkhorst, 1977; Daft & Weick, 1984; Weick & Bougon, 1986). Created through social interchange or negotiated over time (Burrell & Morgan, 1979; Walsh et al., 1988), this cognitive consensuality (Gioia & Sims, 1986) represents the dominant logic or dominant reality of a group (Gephart, 1984; Prahalad & Bettis, 1986).

The third assumption is that the views of managers as a collective are especially salient because managers appear to be at the heart of the cognitive shifts that occur during organizational change. Although the literature on

organizational change has not explicitly differentiated managers and others in terms of the process of change, the interpretive literature has identified managerial views of important changes as critical (Keisler & Sproull, 1982). Numerous scholars have contended that managers serve a significant cognitive function in organizations by interpreting events and ultimately using those interpretations to frame meaning for other organizational participants (Daft & Weick, 1984; Gioia, 1986a; Gray, Bougon, & Donnellon, 1985; Morgan, 1986). Managers' dominant reality (Gephart, 1984) or logic (Prahalad & Bettis, 1986) may influence the construed realities of others (Daft & Weick, 1984; Gray et al., 1985). Because leaders have the formal authority to prescribe interpretations, their viewpoints and how they shift during change can be highly significant and instrumental. Some authors have said that theirs is the social architecture from which organizations draw meaning and significance (Bennis & Nanus, 1985; Pfeffer, 1981, 1982).

Finally, the fourth assumption is that interpretations are made a posteriori (Weick & Daft, 1983). They focus on elapsed action and what has occurred: "An explorer can never know what he is exploring until after it has been explored" (Bateson, 1972: xvi) and "[An individual] cannot know what he is facing until he faces it, and then looks back over the episode to sort out what happened" (Weick, 1988: 305–306). Because, therefore, interpretations tend to be formulated after, not during, events, interpretive research is often built upon events that have already transpired and around which a collective viewpoint has had time to emerge.

Building on these interpretive assumptions. I designed an inductive study to explore the following questions: (1) How do managers construe events over time? and (2) How are those viewpoints linked to the process of change?

METHODS

Research Strategy

The study reported here was designed to identify the interpretations that managers construct to understand key organizational events. I selected 40 managers from a medium-sized, urban, financial-services institution to participate in the study. Each manager was asked to describe and discuss five events that had occurred in the organization over the previous five years. I considered the inductive approach taken here consistent both with my research goals and with the predominant methodology and assumptions used in similar studies (e.g., Bartunek, 1984; Sutton, 1987).

Sample

In order to discover the collective interpretations of managers, I sought viewpoints derived from all managerial levels. Participating managers represented four distinct organizational levels. Since top managers have key interpretational roles (Bennis & Nanus, 1985; Smircich & Morgan, 1982), the participation of all 11 members of the institution's top management, includ-

ing the 3 executives who held major decisional roles in the key events, was essential. Within the middle and lower managerial levels, I randomly selected individuals so that the sample would represent varied tenures and functional areas in the organization. The final sample included 11 executives at the level of senior vice president and above, 10 managers at the level of vice president, 10 at the level of assistant vice president or director, and 9 at the level of manager. Tenures varied from 2 to 35 years. Although a few individuals had not been organizational members at the time of some events studied, I expected that the information they provided about the events would represent the dominant reality (Gephart, 1984), which they would have learned from others in the organization. The functional areas represented were finance, accounting, marketing, customer operations, data processing, legal services, and human resources.

Selection and Presentation of Events

The research strategy allowed the managers to describe and discuss five specific organizational events as well as any additional events they also saw as critical. This strategy followed directly from Schein's (1985) notion that events are critical when participants themselves perceive them as such. Events like those of interest here unbalance established routines and evoke conscious thought on the part of organizational members by their very nature. In so doing, they signal "common breakpoints" for the perception of change (Keisler & Sproull, 1982: 561). Because these events make a difference in people's thought and action, they are "key events" in the eyes of organizational participants.

To determine the events that were key, in pilot interviews I asked four managers—one at each organizational level—to name events of the previous five years that they considered organizationally critical. I chose the five events that all the pilot interviewees mentioned as the key events to study. They were: (1) the acquisition of the company, previously family-owned, by an international financial service giant; (2) the coming of a new president, brought in from outside the company; (3) an organization-wide quality improvement program; (4) the relocation of corporate headquarters; and (5) a corporate-wide reorganization into geographic regions. I presented these five events to each manager interviewed during data collection, using the same events throughout in order to provide a common stimulus around which interpretive comparisons could be made (cf. Pettigrew, 1979).

With each manager, I conducted two semistructured interviews one to one and a half hours long. In the first interview, I collected data about managers' career histories, experiences, and perceptions of the significant operating values and beliefs of the company. The second interview concentrated on the five key organizational events. After presenting the five events in chronological order, I asked the managers to discuss the events in order of importance in as much detail as possible. I assumed that information on events labeled the most important would be the richest and was therefore

best gathered at the beginning of an interview. The Appendix gives the questions used to guide both sets of interviews.

The specific purpose of the key events interview was to learn as much as possible about managers' concerns, perceptions, reactions, observations, and thoughts in connection with the specific key events. A detailed set of open-ended questions that I asked each participant in the same order guided these interviews. I first asked the managers to relate what they knew about the event in question, saying "Tell me about the [specific event] from your point of view—tell me what happened before, during or after the event occurred." This simple request got people to share their specific recollections of the activities and incidents that surrounded the event in question and created the broadest bracket (Schutz, 1967) for the event. As managers made observations, I asked questions to elicit rich details and graphic descriptions or to learn why observations were important to interviewees (e.g., "Could you give me an example of people losing jobs?", "Precisely what rumors did you hear and from where/whom?", and "What was significant or important to you about [that observation]?"). I also asked interviewees to identify particular concerns or questions they had had or perceived others as having had throughout the course of an event (e.g., "What was your reaction to moving into the new building?" "What were common concerns when the new president took over?"). At the end of each event interview, I asked for any other details and pieces of information that the interviewees felt were relevant. All interviews were tape-recorded and transcribed verbatim so that the raw data could be systematically analyzed.

Although each interview covered the same broad topics, I maintained the ability to explore areas of special significance to an interviewee in depth. The goal of the data collection was to understand the perspectives of participating managers, how they saw events through their own eyes. Therefore, rather than probe for information or suggest ideas, I tried to understand and clarify the meanings and interpretations each participant set forth. The procedure is similar to that reported in previous research (Isabella, 1988; Kram & Isabella, 1985). I sought to understand and clarify the frames of reference each manager offered.

ANALYSIS

The analysis procedure followed the grounded theory approach formulated by Glaser and Strauss (1967) and more recently employed by several others (Kram, 1983; Kram & Isabella, 1985; Sutton, 1987; Sutton & Callahan, 1987). This approach requires that data and theory be constantly compared and contrasted throughout the data collection and analysis process. Evolving theory directs attention to previously established important dimensions while the actual data simultaneously focus attention on the theory's suitability as a frame for the most recent data being collected. The result of this fluid movement between theory and data is a reconceptualization, often based on a creative leap (Mintzberg, 1979; Post & Andrews, 1982), that should account for and encompass all nuances in the data.

The process of evolving theory in this research began prior to the actual data collection. Reinforcing the idea of shifting cognitions that has appeared in the literature, my own first-hand experience with and professional observation of several key events at an employing institution had suggested to me that organizational members viewed events differently at different times. Observational notes kept during the unfolding of two major events included numerous references to changes in how people viewed those events over time: concerns shifted, reactions varied, and perceptions were both similar and diverse.

During the data collection phase at the organization studied here, notes on the facts, specific details, and other pieces of information that a number of participants seemed to repeat augmented the evolving theory (Van Maanen, 1983), as did ideas generated during periodic debriefing sessions with colleagues. The resultant preliminary categories used to organize the data included the following: common issues and concerns, such as job loss and finding places to eat in the new building; similar specific facts and details noted, such as the former president's extravagant spending; similar observations and perceptions of what was occurring or had occurred (loss of the favored status of regional vice presidents), noting an improvement in organizational quality owing to reorganization; the same predictions, such as presidents bringing in their own people; and identical recollections of the past, such as being able to smoke and eat at one's desk. I continually modified these initial categories, eliminating old ones and adding new ones to account for newly acquired evidence. Table 1 outlines the initial and final categories used to frame coding of the data.

At the completion of the data collection, each event description was systematically and thoroughly examined for evidence of data fitting these categories. I reviewed each interview transcript, extracted verbatim sections, recorded them on separate sheets of paper to represent the core of an individual's statements, and coded them into the final categories. Approximately 200 such excerpts were recorded. To ensure the accuracy of the category coding, I had an independent reviewer, blind to the purpose of the research, code some data. The independent coder, who was given representative examples from the data of each category, instructed in the rationale for each representative placement, and asked to code 25 randomly chosen excerpts, assigned 24 of the excerpts to the same category that I had, yielding a 96-percent level of agreement. Although this figure may include chance agreements (Zwick, 1988), I considered it reasonable verification of the accuracy of the coding procedure.

After the data were coded, all interview segments were recoded chronologically. I reordered the segments according to the time period they referred to, creating a progression of data proceeding from before each event through its completion. Table 2 shows representative excerpts from the data and describes the flow of responses across each of the five events for five different managers.

Because a process theory is only as strong as the processes hypothesized

TABLE 1
Development of Coding Categories

Preliminary Organizing Categories	Examples	Final Coding Categories
Common concerns	Uncertainty about prospective acquirer Concern about loss of own or others' jobs	Personal effect on self and job
Similar details noted	Former president's extravagant spending Stock prices rising before acquisition	Information tidbits
	Furniture arrangements in new building Actions of new president on taking charge	Changes made and experienced
Similar observations and perceptions	Loss of favor for regional vice presidents	Winners and losers
	Commitment to quality program improved service	Assessments of event
	Adjusting to new routines and styles	Learnings
Predictions	President will bring in his own people	Routine explanations
Recollections	We used to be able to smoke and drink at our desk	Old versus new

as responsible for connections (Mohr, 1982), I examined these coded categories and their relationships with one another for patterns, themes, and processes that would account for the frequency, strength, and presence or absence of any category. The conceptualization presented in this research attempts to outline both the sequence of evolving interpretations and the processes through which those interpretations unfolded.

HOW DO MANAGERS CONSTRUE KEY EVENTS OVER TIME?

The data from this research revealed that interpretations of key events evolve through a series of stages—anticipation, confirmation, culmination, and aftermath. A different construed reality, set of interpretive tasks, and predominant frame of reference characterize each stage. During anticipation, managers assemble rumors and other tidbits of information into an in-progress frame of reference. During confirmation, their frame of reference draws on conventional explanations and comparisons to past events. During culmination, people compare conditions before and after an event and look

TABLE 2
Characteristics in Time Sequence for Each Event[a]

	Events in Chronological Order			
Acquisition	New President	Commitment to Quality	Relocation	Regionalization[b]
We heard speculations that the company was going to be sold for as long as 6 months maybe. Several companies were mentioned.	After M left, there was all kinds of chattering about who would replace him, about leading contenders.	Just before the program was announced, there were rumors about loss of jobs.	There were the usual rumors about where the new headquarters would be.	Now that CTQ is under way, the question is where do we go from here. Regionalization is where.
I've heard of companies being bought out, that if they were bought out by a big conglomerate, that company would come right in and wipe out the management. We expected that.	R came in and spent the first six months visiting our field sites, probably because that was his expertise at the company he came from.	The program is really a cleverly marketed job enrichment program. The organization has grown and there were a lot of inefficiencies needing attention. I saw it as a first wave of a cost containment process.	There was a lot of participation, not in the selection of facilities, but involvement of home office people. This helped create a psychological adjustment.	Its purpose is to give more responsibility and to provide new career paths.
During the first wave of what's going to happen in the company, really not much did. We just kept doing what we were.	It took me quite a while to get the picture of what his understanding of where the company was going and what changes were to be made.	While we want to assure everyone a job, there is reason to question whether or not some people have the ability to acquire the skill to make the transition.	The evolution of size of offices was logical. But there was a quantum leap between assistant VP and VP. No one really could understand why the big difference.	
After a while, I began to realize the security of our new parent. Felt much more secure than being out there alone.	He's been fairly consistent with his ideas about moving us into new markets and gearing us up to be the kind of company that will survive. He relies heavily on some key people at the top and this is his strength.	Recently a steering committee was formed to monitor the progress of the program and keep track of the consequences.	An interesting thing that happened was that the quality of dress went up. So we are becoming the more professional company that we want to be.	

[a] Examples come from interviews with five different managers.
[b] This event was in progress at the time of the research.

for symbolic meaning. During aftermath, they review the consequences of the event. The following sections discuss each stage in detail.

Anticipation

Countless rumors, hunches, suspicions, and scattered bits of information pulled together as well as possible characterize the collective interpretations representing the first interpretational stage. These fragments are analogous to randomly arranged pieces of a puzzle for which managers possess neither a final picture as a construction guide nor a specific indication of whether the final picture will contain some, all, or none of the pieces. As one manager said,

> We weren't sure exactly what was going to happen, but the signals were present that something was going on. Nobody knew a lot; everyone knew just bits and pieces. We struggled to have it all make sense (acquisition).[2]

The construed reality at this stage is composed of both rumors and disconnected pieces of information (see Table 3). A prolific rumor mill that supplied speculative information about possible upcoming occurrences seemed to have been in action before each key event occurred. In general, these rumors were neither malicious nor fantastic; they were "bogies" expressing fear or anxiety about what might or might not occur (Rosnow & Fine, 1976: 23). There were rumors about the names of possible acquirers, possible sites for a new corporate headquarters, and possible structural changes designed to deal with declining service:

> A common rumor of takeover was American Express (acquisition).
> For a while, I was hearing rumors that the company would relocate out to the suburbs (relocation).
> Our services were down; there were lots of complaints. Everyone suspected something was going to happen (commitment to quality).

Speculation about potential internal and external presidential candidates was also rampant:

> There was a leading internal candidate whose name kept coming up. It was well known in the company that he very much wanted to be the new president. There were also rumors of outside people that were being talked to secretly (new president).

Such rumors are significant because they provide structure to uncertainty, especially when information is not forthcoming from official sources (Rosnow & Fine, 1976). In the absence of alternative information from upper

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[2] Excerpts are followed by the name of the event to which they pertain.

management, organizational members have a heightened sensitivity to any information that suggests or could be construed as suggesting the inevitability of an event. Rumors provide that concrete something around which they can begin to construct an interpretational portrait.

In addition, organizational members need to account for the scattered pieces of concrete data that are observable and incorporate them into the interpretational portrait. Tidbits of concrete information, like the rise in the stock price before the acquisition and the actions of the soon-to-be-replaced president, hinted but did not conclusively indicate that an event was about to happen. These tidbits appear to encourage speculation and conjecture:

> It was one day, you know, and we were hearing that the stock prices were going up. Everyone was talking up "does this mean the company will be bought out?" (acquisition).
>
> Our old president was spending a lot of money taking trips, refurbishing the company plane, mountain climbing in S. Africa somewhere, things like that . . . we knew this could not go on for much longer (new president).

The primary interpretive task of managers at this time, therefore, is assembly of an interpretive portrait based on speculation and anticipation. As they try to develop understanding, they must piece together ill-fitting information into a coherent and cogent frame of reference. In uncertain situations, the extraordinary prompts cognition (Langer, 1978; Lewin, 1951; Louis, 1980; Schutz, 1967), and the rumors and tidbits of information provided just that. The result is an in-progress frame of reference that might be called an "unframe," a whole that is in fact an assembly of tenuously connected pieces.[3] Assembly is likely to continue until a reasonable picture is constructed or a new reality is confirmed.

Confirmation

Following the stage of anticipation is confirmation, the interpretational stage during which an event is "standardized." Interpretations at this stage can be described as using a conventional frame of reference. Traditional and routine explanations of what an event will personally mean to people characterize corrective interpretations at this stage. These explanations have been voiced before or represent conventional deductions, logical associations, or almost stereotypical relationships. Interpretations at this stage provide no new or creative insights but primarily reflect understandings that worked or are believed to have worked in the past—presumptions about what will be, based upon what has been:

> When I found out that we were acquired, I thought of another financial services company here that was recently purchased.

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[3] The idea of an "unframe" draws on Abelson's (1976) "unscript," that in novel situations behavior is unscripted (cf. Langer, 1978).

TABLE 3
Construed Realities at Different Stages[a]

Elements of Construed Realities	Acquisition	Key Events		
		New President	Commitment to Quality	Relocation
Anticipation				
Rumors	There were certain leaks. Sometimes the rumors would come from somebody in Boston talking to someone in N.Y. who heard from someone in N.J. that something was going on. A common rumor of takeover was American Express.	Within the company, it was rumored that Sam K. was the likely internal choice.	Our service was down; there were lots of complaints. Everyone suspected something was going to happen.	For a while, I was hearing rumors that the company would relocate out to the suburbs. I was worried because there was no way that I could get transportation all the way to that location. Fortunately, that was only a rumor.
Tidbits	It was one day, you know, and we were hearing that the stock prices were going up. Everyone was talking up, "does this mean the company will be bought out?"	Our old president was spending a lot of money taking trips, refurbishing the company plane, mountain climbing in S. Africa somewhere. Here again it gets back to rumors and hearing people talk, but there was a lot of bickering going on between top management cause M was never around to solve problems.	I knew there were negotiations with a major consultant that our sister organization had used.	No one appeared to be paying attention to problems that the old building had. Everyone knew the elevators could not be fixed.

TABLE 3 (continued)

Elements of Construed Realities	Key Events			
	Acquisition	New President	Commitment to Quality	Relocation
Confirmation Conventional explanations	When I found out we were acquired, I thought of another financial service company here that was recently purchased. The purchaser came and decimated that organization such that they have now folded. I wondered if that was the road we were headed down.	When a new president comes on board, they often bring in all their own people.	First off, I thought it's just another BS program like we've been going through. We were going to get these fancy binders and spend days going through this stuff and come back and put the binders away and get back to business as usual.	There is lots of new space in this city, so it just made sense to move, rather than renovate our old headquarters.
References to past events	The last organization I worked for went through an acquisition, and basically nothing changed, so I expected that nothing would change here too.	R came from NEL and there are to the best of my knowledge no NELers here. I think that is unusual. When I & A bought out Forest Mann, they became a wholly owned subsidiary of I & A and then each of the senior slots were in turn filled.	We heard that our two sister organizations had successfully gone through this program and I just assumed we would get the same results.	I was at RTS when they relocated their headquarters and I immediately thought of all the things that happened and figured out I was in for more of the same.

TABLE 3 (continued)

Elements of Construed Realities	Key Events			
	Acquisition	New President	Commitment to Quality	Relocation
Culmination Double exposures	During the first wave of what's going to happen in the company, really not much did. We just kept doing what we were.	There were difficulties meeting the conflicting demands of both R and my boss. R would call up my boss. R would call me for information rather than ask my boss to ask me, as was the case before.	We all felt there was a need for example setting by top management because none of the rules worked. Many of us were confused about how to act.	After we were in this new building for a month, top management decreed that there would be no eating at our desks, not even snacking. We were all very annoyed by the sudden change in rules.
Symbols	When the parent company came in and didn't change anything about how business was run, I knew they had confidence in R.	When R came in the first thing he did was go out into the field and meet with the agents. Notice that I didn't say regional VPs who were the old guard of power. I think he intentionally did not call on the RVPs to signal their loss from favored status.	Many of us watched the pattern of who got asked first at their level to attend. Whether it was true or not, some believed being one of the first signaled chosen status.	I guess messages are being sent, consciously sent. The size of the office definitely sends a very powerful message; the door sends one. We have so many furniture styles, we may not see it, different size offices and configurations indicate your level in the company.

TABLE 3 (continued)

Elements of Construed Realities	Key Events			
	Acquisition	New President	Commitment to Quality	Relocation
Aftermath				
Winners and losers	All I know is that the stock bonus changed just before the takeover. Those top execs who participated immediately did very well financially.	The regional VPs used to be in power here but R has gone more to an agency concept. They were the real losers here.	Despite what we've said, some people just couldn't make the transition. On the other hand, some people have just blossomed.	There are people whose job depends on the computer terminal and their workspace allows no room for that equipment. They appear as the losers.
Consequences; strengths and weaknesses	The acquisition was good because we gained more sta-bility and a large financial base plus the parent com-pany didn't really change anything about how we do business.	He's been fairly consistent with his ideas about moving us into new markets and gearing us up to be the kind of company that will survive.	It seems the company's reaction these days is, okay, let's do a study and see how we are doing. There have been an awful lot of studies around here recently.	There was a definite noticeable change in the quality of dress since we moved into our new building. This is important to the organization if we are to become a more professional company.

a Only events that had progressed through all four stages at the time of the research are included.

> The purchaser came in and decimated that organization, such
> that they have now folded. I wondered if that were the road we
> were headed down (acquisition).

The construed reality at this stage is composed of conventional expla-
nations and references to past similar events (see Table 3). Conventional
explanations state interpretations that are common responses to the partic-
ular type of event that is occurring, or they state what is known to have
happened in similar events in other organizations. Conventional explana-
tions might describe how an acquiring company completely alters the char-
acter of an acquired company, how a new president brings in favored staff to
replace previous personnel, or how reorganizations bring job loss:

> You just always hear stories about how the acquirer comes in
> and removes all traces of the old company . . . you know, re-
> places badges, signs, stationery. It was hard not to believe that is
> what we were in for here (acquisition).
> When a new president comes on board, I always assumed they
> bring their own people with them eventually. I thought, there-
> fore, that most of our current top managers would be leaving or
> be fired (new president).
> Never mind all the talk about providing quality service. Most of
> us believed that this reorganization, like others, was going to
> mean losing jobs (regionalization)

Similarly, interpretations at this stage also contain comparisons to past
similar events, in which the past is used to set expectations for the future:

> I was at RTS when they relocated their headquarters and I im-
> mediately thought of all the things that happened and figured
> out I was in for more of the same (relocation).
> The last organization I worked for went through an acquisition,
> and basically nothing changed, so I expected that nothing would
> change here too (acquisition).

This process of interpretation parallels reasoning by analogy (Neustadt &
May, 1986), in which people view present events as like or as different from
other historical occurrences. These elements emerged more frequently here
when interviewees had personally experienced a similar or generalizable
event in another organization and created a series of scenarios of what they
presumed could happen based upon what had occurred in the past. These
scenarios, similar to vignettes (Gioia & Poole, 1984), potentially contained
both cognitive schema to explain a situation and a behavioral script to guide
the behavior of self and others.

Taylor and Fiske (1978) suggested that individuals react primarily from
preprogrammed cognitions, or preexisting cognitions representing past oc-
currences. At the beginning of interpreting a change, it would seem that, in
fact, the first complete frameworks people use are interpretations that have
been used in the past. In the absence of complete information about the

future, these conventional explanations provide convenient points of comparison and a reasonable frame for the event in question (Schutz, 1967). They also help reduce anxiety because they set forth a reasonable course of behavior and action.

Therefore, I called the primary interpretive task of this stage "standardization." The conventional frame of reference serves as a "context-specific dictionary" (Berger & Luckmann, 1966: 138) managers can use to reference and compare their current experience. Because a "human cognitive apparatus" (Weick & Daft, 1983: 75) is more comfortable with the past than the present (Weick, 1979), the conventional point of view also appears to give managers an answer to the question of what the event will mean to them, at least until more information is forthcoming.

Culmination

Following confirmation is the stage of culmination, during which people amend their view of an event. Interpretations no longer represent standard or presumed views but reconstructed views, frames of reference that are being amended as the event occurs to include new information or omit information no longer of value. The conventional frame of reference brought history into the present; at this stage, history is in a sense being made. A real hands-on sense of experimentation and testing and learning by doing characterize collective interpretations at this stage. Since each event brings with it the need to create new norms and execute new behaviors, old views just may not be effective. New working procedures or relationships, new facilities and interaction patterns, new and unfamiliar surroundings, or new rules and dictates make the development of new realities instrumental:

> I felt that all of a sudden things were being asked of my department and me that: (1) we weren't staffed to do and I wasn't trained to do and (2) I didn't know either one of the new top people and what their expectations were. I kept asking how could I handle this? My answer was figure it out on my own (new president).

The construed reality at this time consists of two elements. Interpretations in the culmination stage are peppered with "double exposures," interpretational portraits that contain images of before and after. People point out that old behaviors are not working and that new ways of interacting are required; or they contrast past standards with present conditions (see Table 3). The managers studied here often expressed a sense of confusion about the old not working or a feeling of being perplexed about new behaviors replacing old ones. People were confused by what was required under the new structure created by the quality program; they were perplexed by actions of the new president that appeared to violate old chains of command or other priorities; they reminded themselves of the loss of familiar patterns occasioned by the move to the new building, such as shopping at the local department store or eating at familiar luncheon spots:

> We all felt there was a need for example setting by top manage-
> ment because none of the rules worked. Many of us were con-
> fused about how to act (commitment to quality).
>
> There were difficulties meeting the conflicting demands of both
> R and my boss. R would call up directly and ask me for infor-
> mation rather than ask my boss to ask me, as was the case before
> (new president).
>
> In our old building, we could smoke and drink at our desk. Now
> there are rules against these. Things just are not the same (relo-
> cation).
>
> We used to be able to go out at lunch and shop at the local
> department store. Also there were many relatively inexpensive
> luncheon spots. Now, at our new location, there are only a few
> restaurants and boutiques, all of which are expensive (reloca-
> tion).

These observed incongruities have themes reminiscent of those that typify the adjustment to organizational change described in previous research (cf. Starbuck, 1976).

The construed reality of this stage also consisted of direct references to the symbolism of certain actions, gestures, and decisions. Interviewees described both a phenomenon and the meaning they attributed to it. There was overt acknowledgment of symbols and an attempt to understand what they meant. For example, many individuals talked openly about the birthday parties that the new president started as symbolic of his intent to show that he cared about their concerns and well-being, or they imbued chance encounters in the corridors and elevators with significance. Managers noticed the lack of visible changes in the firm after the acquisition and saw this as support for management's contention that little would change; managers also saw people go into the "open pool," a labor pool created to accommodate individuals whose job was phased out in the commitment to quality program and who were available for redeployment, and then get reassigned; and they saw changes in dress and appearance as a result of being in the new building. As symbols, all of these actions and activities came to denote much more than themselves (Pondy et al., 1983):

> R held monthly birthday parties. If it was your birthday, you
> could come and have coffee and ask any questions you wanted.
> People asked the stupidest questions sometimes, but there was
> always an answer immediately or in 24 hours. This signaled to
> me that R really cared about making this company better (new
> president).
>
> We watched "the open pool." To our surprise people actually
> got new experiences and skills and were reassigned without too
> much interruption. The process actually worked (commitment
> to quality).
>
> I guess messages are being sent, consciously sent. The size of the
> office definitely sends a very powerful message; the door sends
> one. We have so many furniture styles, we may not see it, dif-

ferent size offices and configurations indicate your level in the
company (relocation).

Symbolism appears to play an important role in facilitating the learning
of new behaviors, norms, and schema, as well as in shifting the culture of an
organization (Daft, 1983; Dandridge, Mitroff, & Joyce, 1980; Louis, 1983;
Smircich, 1983). The culmination stage is a time when individuals appear
very receptive to symbolic messages, especially management symbols (Orn-
stein & Greenberg, 1988), those connoted by managerial actions and behav-
iors. Since the established routine has been disrupted, managers search their
surroundings for clues from which to derive new meaning or reconfirm old
understandings, and symbols provide that valued information. Symbols
bring double exposures into focus.

Therefore, the interpretive task at this stage is reconstruction. Managers
are actively reconstructing their environment, deciding what to retain and
what to alter. At this time more than ever, there could conceivably be varied
and multiple individual realities and divergent interpretations as individu-
als attempt to make sense of the changes experienced.

Aftermath

The final interpretive stage is aftermath, during which an event is eval-
uated. As managers test and experiment with a construed reality that moves
beyond the traditional boundaries of past sense making, there comes a grow-
ing, concrete realization of the permanent changes wrought and of the con-
sequences those changes and the event itself have had for the organization
and its members. The predominant frame of reference becomes evaluative.
Thus, characteristics of collective interpretations at this stage are a search for
consequences, an active seeking of and receptivity to the strengths and
weaknesses of changes wrought by the event and, whenever possible, a
reassertion of certainty:

> Our parent organization has afforded this company a tremen-
> dous amount of security and I did not come to realize this fact
> until recently. There has been a return to certainty (acquisition).
>
> It seems the company's reaction these days is, okay, let's do a
> study and see how we are doing. There have been an awful lot of
> studies around here recently (commitment to quality).

A prominent part of the construed reality at this stage was identification
of winners and losers. Collective interpretations precisely identified groups
and individuals who benefited from some aspect of the event and those who
did not fare.as well. For example, the actions of the new president clearly
communicated that the regional vice presidents, who had once had much
organizational power, were to be relatively powerless in the new organiza-
tion. In the case of the quality program, many managers believed that some
employees were simply not retrainable or motivated to enrich their jobs, so
they would be natural losers:

> Despite what we said about people not losing jobs, the under-
> current throughout the entire program has been that we have got
> a lot of employees who will not make the transition because they
> do not possess the skills required. We hire an awful lot of very
> limited people in this company, very limited clerical types and
> these are the ones who are the losers in this program (commit-
> ment to quality).

The construed reality during aftermath also consisted of conclusions
drawn as to the positive and negative consequences of some aspect of an
event, and to the resultant strengths and weaknesses (see Table 3). Managers
made direct references to pros and cons of the situations wrought by
changes. People talked positively about the more professional quality of the
atmosphere and of employees' demeanor in the new building; they dis-
cussed the stability the acquirer afforded the firm; they pointed to jobs lost
and individuals not adjusting well to the commitment to quality program:

> There was a definite noticeable change in the quality of dress
> since we moved into our new building. This is important to the
> organization if we are to become a more professionalized com-
> pany (relocation).
> The acquisition was good because we gained more stability and
> a large financial base plus the parent company didn't really
> change anything about how we do business (acquisition).
> Despite what we have said, some people just couldn't make the
> transition. On the other hand, some people just blossomed (com-
> mitment to quality).

Thus, the final interpretive task is evaluation. Assessing an event in
terms of its consequences, thus putting it and accompanying changes in
perspective, appears to create a sense of closure to the experience. The
assessments made may also become the standardized views managers will
carry over to the next similar event they experience.

HOW ARE CHANGING VIEWPOINTS LINKED TO THE PROCESS
OF CHANGE?

In addition to four distinctive stages in the interpretation of change, the
data from this research also revealed processes that move individuals from
one interpretive stage to another. External events appear to precipitate such
shifts. These events are akin to the triggering events conceived by previous
researchers (Billings, Milburn, & Schaalman, 1980), events signaling that a
cognitive redefinition of a situation is required. The action of trigger events
appears to parallel the process of change Lewin (1947) called unfreezing,
moving, and refreezing. The first interpretive shift begins when a definitive
announcement is made that an event will occur. The first trigger event be-
gins to unfreeze organizational members and put them on alert that some-
thing is about to change. The second interpretive shift begins when the event
is actually experienced—here, when organizational members moved into

the new building, or the new president started his first day. The second trigger event begins to move individuals into a state where change is necessary and required. The third interpretive shift begins with any number of smaller events that signal the permanence of changes precipitated by the key event. For instance, the new president follows through on stated objectives, or a task force evaluates the status of the quality program, or new policies for behavior are institutionalized in the new building. This third trigger event begins the refreezing process that establishes a new status quo.

Although various triggers in the unfolding of an event spark the shift from one interpretational stage to another, personalized experiencing of and affective reaction to triggering events keep the movement going. Van de Ven (1980b) suggested that personal crisis initiates cognition. Similarly, it seemed in this research that when an event or some aspect of it became real—in the sense that it had directly affected or was about to directly affect people or their work—interpretive shifts gained momentum (see Table 4). For the first interpretational shift, such personalized experiencing translates into concern about what an event will mean in an individual's own life. Personal fit with and identity within an organization are brought into question. For the second interpretational shift, personalized experiencing translates into concern about how work will be affected. For the third interpretational shift, personalized experiencing translates into concern about laying the event to rest by developing a final perspective.

Shifting to Confirmation

An announcement or notification that an event will occur triggers the interpretive shift from anticipation to confirmation. For the events studied here, most often top management made an announcement through official channels. For example, a company memo confirmed that an acquisition had been made and a new president selected, and the commitment to quality program and relocation were announced at company-wide meetings. Previous research has found similar announcements of the inevitability of an event to be leaders' attempts to signal a change in the construed reality (Sutton, 1987).

As organizational members attempt to make sense of an event, they personalize it (see Table 4), expressing great concern for how the event will affect each individual. "What will this mean to me?" and "How do I fit in?" are the affective reactions fueling the interpretive shift:

> I think there are an awful lot of unknowns associated with being bought. What will they do? Will they move the company to wherever from here? I think people were concerned from the standpoint of what did it mean to us, would they come in and replace everyone, and, all of a sudden, are we somebody else and we really don't know who we are? (acquisition).

Managers wondered whether they would lose their jobs as a result of the quality program; they were concerned about adapting to the management

TABLE 4
Examples of Personalized Experiencing[a]

Affective Reactions	Key Events			
	Acquisition	New President	Commitment to Quality	Relocation
Shift to confirmation: "What will this mean to me?"	I think there are an awful lot of unknowns associated with being bought. What will they do? Will they move the company to wherever from here? I think people were concerned from the standpoint of what did it mean to us, would they come in and replace everyone, and, all of a sudden, are we somebody else and we really don't know who we are? I know I was.	When a new president comes on board, they often bring in all their own people. I wondered what they would mean for me and my job.	People need to know that they are not going to lose their jobs over this. I have one girl in my area who is telling people that people are going to get laid off once regionalization is implemented. . . . I think people are real scared about what is going to happen, what's going to happen to their job.	Once the relocation site was announced, people's main concern was how close they would be to the local department store. That's true. There were concerns about proximity to buses and parking and shopping. I think most people were really concerned about being buried in a much larger building and losing their identity.

TABLE 4 (continued)

Affective Reactions	Key Events			
	Acquisition	New President	Commitment to Quality	Relocation
Shift to culmination: "How will my job be affected?"	Once were were acquired, we all waited for something to happen to our jobs. We wondered what it would be—elimination, less money, less people?	Once our new president arrived, I started to become very concerned. I know that you have to prove yourself all over again. You just don't know what a new person will expect from you.	There are a lot of people concerned about losing their jobs in this commitment to quality program. Some people's jobs are getting phased out and they will have to learn new skills and I think they are scared.	The company really made a big deal out of making sure that all people at the same level got the same amount and type of furniture. Yet they didn't consider what you need to do your job.
Shift to aftermath: "What has the event meant overall?"	Looking back, the acquisition has given us the financial security that we needed. We have been able, therefore, to do a lot of things we would not have been able to accomplish.	After I had been here about six months, we all began to wonder if his coming-on-board was really good for the company. The answer was a pretty strong yes.	We have set up a steering committee to monitor the progress of the commitment program. This is a good idea, but it has taken on a very secret status.	There is now a feeling of inequity and class difference in this new building. There is very little privacy or concern for individual needs.

a Only events that had progressed through all four stages at the time of the research are included.

style of the new president; and they were concerned about whether the new headquarters location would fit their current lifestyle. In general, they were concerned about their fit with the new structure and who they would be within that structure.

Shifting to confirmation may bring an end to anticipatory speculation, but it also begins the unfreezing process in preparation for change. Aware now personally that something is about to change, individuals search for reasonable explanations of those changes to come.

Shifting to Culmination

The actual occurrence of an event triggers the interpretive shift from confirmation to culmination. The new president begins his first day; the quality program kicks off; the new building is occupied. In all cases, a discernible and tangible event created a major change in the organizational texture and communicated that a new reality was in order (Sutton, 1987).

Although the trigger events signaled a change, the events became personalized when individuals began to experience living in the new situations (see Table 4). The fuel for the second interpretive shift was no longer individual fit, but the performance and execution of work responsibilities. "How will my job be affected?" and "Will I be able to execute my responsibilities?" are the questions fueling interpretations:

> Once our new president arrived, I was concerned about adapting to a new management style. I knew our previous leader's preferences, but I didn't have any idea about R. I could no longer be certain about how to do my job (new president).
>
> There are a lot of people concerned about losing their jobs in this commitment to quality program. Some people's jobs are getting phased out and they will have to learn new skills, and I think they are really scared (commitment to quality).

The answer to these questions encourages individuals to begin the process of change.

Shifting to Aftermath

The third interpretive shift, from culmination to aftermath, occurs as time wears on and there is some indication that an event is being processed, especially by upper management. Most often, discernible activity precipitated this interpretational shift; at other times, the elapsing of a certain length of time—generally six months—signaled the appropriateness of a new construed reality.

Personalizing at this time was reflected in people's need to come full circle and decide whether the event had been advantageous or disadvantageous to them personally and organizationally (see Table 4). "What has the event meant overall?" is the question fueling this final interpretive shift:

> After I had been here about six months, we all began to wonder
> if his coming-on-board was really good for the company. The
> answer was a pretty strong yes (new president).
>
> There is now a feeling of inequity and class difference in this
> new building. There is very little privacy or concern for indi-
> vidual needs (relocation).

Answering this question appears to begin the institutionalization, or refreez-
ing, process (Lewin, 1947).

A MODEL OF EVOLVING MANAGERIAL INTERPRETATIONS OF CHANGE

Although enacted realities can include multiple and varied realities
(Smircich & Stubbart, 1985), this research has tapped the pieces that com-
pose a collective interpretational portrait of key events. Some authors have
suggested that cognitions and perceptions can differ by individuals' organi-
zational function or level (Dearborn & Simon, 1958; Ireland, Hitt, Bettis, &
Auld de Porras, 1987). This research, which is closer in spirit to Walsh's
(1988) work, concentrated on distinct similarities across function and level
in the manner in which managers construct their world.

Using interview data about past key organizational events, this research
explored how managers collectively viewed events over time and how those
viewpoints were linked to the process of change. The results suggest a model
for understanding how interpretations evolve as a change unfolds (see Fig-
ure 1). Although this model neither details action taken as a result of inter-
pretations nor their direct effects on the interpretations of others, it does
attempt to capture how managers collectively construe events. In so doing,
it concentrates not on a description of the interactional processes through
which individuals come to share meanings but on the identification and
description of the frames of reference managers share during specific
changes.

The model describes a sequence of four distinct stages—anticipation,
confirmation, culmination, and aftermath—through which interpretations
progress. Each stage has a predominant frame of reference, interpretive task,
and construed reality. The transition from one stage to another is initiated by
a trigger event and fueled by the personalization of that trigger.

As the data show, the process of managerial interpretation consists of
rhythmic shifts in a construed reality as an event unfolds. These shifts would
seem to support the contention of previous researchers (e.g., Weick & Daft,
1983) that construed realities constantly change as new facts arise and new
questions are asked. Actual rumors, speculative hunches, and disconnected
pieces of information characterize anticipation, as individuals attempt to
deal with the uncertainty of limited information. Conventional interpreta-
tions and comparisons to past similar events characterize confirmation, as
managers question how they will individually fit into their organization
after an event occurs. Questioning former rules and behaviors, testing and

FIGURE 1
Evolving Interpretations of Key Events

Process of Change	——— UNFREEZING ———	MOVING ———	REFREEZING ———	
Interpretive Trigger	Announcement that event is pending	Event occurs	Derivative events; passage of time	
Personalization of Trigger	"What will event mean to me?"	"What will event mean to my work?"	"What has event meant overall?"	
Interpretive Stage	ANTICIPATION →	CONFIRMATION →	CULMINATION →	AFTERMATH
Construed Reality	Rumors, scattered information and observations	Conventional explanations; references to past similar events	Double exposures; symbols	Consequences; strengths and weaknesses; winners and losers
Interpretive Task	Assembly	Standardization	Reconstruction	Evaluation
Predominant Frame of Reference	In-progress	Conventional	Amended	Evaluative

experimenting with new interaction patterns, and using intense symbolism characterize culmination, as managers wrestle with how their work, relationships, and other aspects of daily responsibilities will be affected. Finally, appraisals of the actual consequences of an event, including the identification of winners and losers, characterize aftermath, as managers arrive at a final determination of what the event has really meant.

This research went beyond assertions that a significant amount of cognition is associated with change by outlining the particular cognitive patterns accompanying the change process. As suggested in the model, the fundamental stages of change—unfreezing, moving, and refreezing (Lewin, 1974)—are accompanied by the interpretive tasks of assembly, standardization, reconstruction, and evaluation. More specifically, the findings of this research parallel contentions by McCall (1977) and Starbuck (1976) that

frames of reference are a predominant organizational sense-making device during change. These viewpoints act as the cognitive logic that, when activated, organizes comprehension of event-based situations (Abelson, 1981). In the case of change, an in-progress frame of reference gives way to a conventional frame of reference, which gives way to amended viewpoints that become an evaluative frame of reference. Initially, while people anticipate an event, they pull pieces of information together into a frame-in-progress. In preparation for the occurrence of change, they view the event from conventional viewpoints that allow them to know both what will change and how it will change, thus reducing uncertainty. Once the event has arrived, the thrust of cognition becomes making sense of the new situation, always in comparison to the old, in the form of an amended or reconstructed frame of reference. Finally, refreezing seems to be associated with a broadening perspective and general learning about what the event meant, and the end result is an evaluative frame of reference.

Thus, collective interpretations of key events move from unformed and tentative to well-constructed, well-processed viewpoints. The implication of this progress is that the fullest understanding of an event may come from moving through all the interpretive stages. By so doing, individuals formulate an overall meaning for the event that is enriched by the stages that have come before. The current research adds complexity to the question, "What does an event mean?" Determining what an event means appears to be a process of going through a series of interpretative stages. In fact, it may well be that the strongest and most substantial conventional viewpoints are the result of a previous interpretive cycle that made sense of a situation through all four stages.

Abelson (1963) noted that the most thorough cognitive processing was based on "hot cognition," or emotion-laden cognition. In this research, it was very clear that the collective construed reality included both elements of fact and feelings and emotional reactions. To the extent that emotion and cognition are intertwined (Gioia, 1986b; Park, Sims, & Motowidlo, 1986), personalization of trigger events appears to bring such an affective dimension into play.

IMPLICATIONS

In support of those who have contended that considerable cognition accompanies the process of change, this research contributes to creating a model for understanding how interpretations evolve as an organizational change unfolds. It describes the unique interpretive tasks, predominant frames of reference, and construed realities associated with each of four interpretive stages; identifies the interpretive triggers accompanying the process of change; and demonstrates how the personalization of those triggers fuels the movement from one stage to the next.

These results have implications both for managers' interpretational role in the management of organizational change and for further research on such

change. First, this research suggests a new perspective for thinking about resistances to change. Previous research has cautioned managers to identify such resistances (Lewin, 1951) and select a change strategy that will minimize or eliminate them (Kotter & Schlesinger, 1979). This research, however, indicates that resistances to change might alternatively be viewed, not as obstacles to overcome, but as inherent elements of the cognitive transition occurring during change. The results of this research suggest that self-interest, mistrust, or preference for a status quo may be concrete manifestations of more subtle cognitions. Specifically, what has been labeled self-interest may simply be personalization of an event. In changing situations, perhaps it is not so much that people want to hold on to what they have as that they are simply questioning what the change will mean to them. They are merely anticipating possible loss. Similarly, what appears as misunderstanding and mistrust could well be an external reflection of an in-progress or conventional frame of reference at work. Preference for a status quo could also be a manifestation of the tension double exposures produce as people employ an amended frame of reference. If managers accept such a view, what becomes important is not overcoming these reactions, but acknowledging that such frames of reference exist, will change, and actually serve a crucial cognitive function in helping people to understand and come to terms with an event.

To the extent that managerial responsibilities are more interpretational than operational (Daft & Weick, 1984), this research has implications especially for the actions of leaders during events. Although my focus limited exploration of how collective interpretations influenced the behavior or interpretation of others, certain predictions based on the model can be proposed. If the interpretational role of managers is to influence the interpretations of others (Daft & Weick, 1984), these research findings imply that such a role would vary as a change unfolded. In the anticipation stage, managers might focus on managing the rumors and concrete information individuals have. Although top managers may themselves be uncertain, providing as much information as possible to subordinates could increase the likelihood that they will fit reasonable pieces of the puzzle together. In the confirmation stage, leaders might manage the standards against which individuals measure the upcoming event. This would require leaders to be aware of possible and alternative conventional explanations and to communicate the unlikeliness or feasibility of those alternatives when necessary. In the culmination stage, leaders might manage symbols, especially the management symbols (Ornstein & Greenberg, 1988) that communicate what is important to the organization. Finally, in the aftermath stage, managers may manage the assessments that individuals create by suggesting reasonable, if not right (Weick & Daft, 1983: 76), overall perspectives.

This research also has implications for further study. It suggests that at the organizational level, further exploration of how managers collectively construe organizational events is needed. The particular events studied here were large-system events within one organization whose very nature and

potential impact on the company's finances might increase information processing (Pfeffer & Salancik, 1978). The present model is, therefore, somewhat limited in its descriptive power; it is not known how generalizable it is as a description of interpretations of different, perhaps smaller-scale events, such as an employee's dismissal or problem-solving meetings. Also unknown is the extent to which the construed realities portrayed depended on the particular organization studied and its culture.

This research concentrated on drawing a portrait of managerial interpretation; it is also not known whether these stages only describe the evolving interpretations of managers. To the extent that all organizational members enact their realities (Weick, 1979), the model constructed may have relevance as a description of the evolving cognitions through which other organizational members come to understand and adapt to change. Further research is needed to determine if the model developed by this study fits nonmanagers as well as managers.

Additionally, this research poses the interesting question of how a convergence in collective frames of reference comes about. How is a dominant reality developed? Does it arise because individuals use the same cognitive processes (i.e., go through the same stages) or because social interaction occurs (Burrell & Morgan, 1979)? Answering this question would require understanding individual contributions to collective understandings. Are there systematic variations in the manner in which individuals rely on specific frames of reference? The evolution of interpretations in terms of understanding issues about information availability, interaction patterns, and the impact of types of events are also grounds for continuing scholarly inquiry.

CONCLUSIONS

Like much previous organizational sense making (Weick & Daft, 1983), this research relates the history of views of key events in one organization. That history was propelled by change but contains more than the actual changes. That history contains the cognitive logic that facilitated organizational members' understanding and adjustment during change and that will most likely guide their understanding of and adjustment to events in the future. As one manager said,

> As the decision maker, you move your decision to those people
> closest around you and expect them to be the prophets of that
> message, and then that goes, and you know the further you cas-
> cade that down into the organization, the more it becomes di-
> luted. And, the more the background is lost, the more the ratio-
> nale, the more the meaning of it all is lost . . . unless there's a
> sense of history that has been retained in the translation.

The evolving interpretations of key events provide that sense of history.

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APPENDIX

Interview Questions

First Interview

Information on the highlighted items was gathered by asking the following:

Current job. Tell me a little about yourself.
   What is your present position in this company?
   What are your major responsibilities?
   How long have you held this position?
   What do you particularly enjoy about your job?
   What are some of the challenges you face?

Career history. Tell me about how you got to be doing this.
   How did you get started in this profession/job?
   What has prepared you for this job? (prior positions, educational background)
   What other jobs have you had? (at this company or at other companies)
   Why did you make the career changes that you did?
   How were those career decisions affected by events in your nonwork life?

Organizational values and beliefs. Tell me about what this organization is like.
   What are its values, from your point of view?
   What is important to this company? How do you know this is important to the company?
   If I were a new employee, what are the important do's and don'ts that you would want
      me to know about?
   What does this company do well?
   What are your major concerns about this company?

Second Interview[a]

   Questions were as follows: Tell me about the [specific event] from your point of view—
What happened before, during or after the event occurred?[b]

   Before the event—
   Help me understand what it was like to be in the organization at that time.
   Do you recall any incidents or events that preceded the [specific event]? Can you describe
      those events?
   What did people do? What was it like to work here then?
   What did you think at that time? What seemed important or significant?
   Why were these important or significant?

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   [a] The format was repeated for each of the five events.

   [b] Although individuals were free to begin discussing an event at any point during its unfolding, these questions represent the areas covered for each event.

What concerned you at the time?
What questions do you remember having or asking?
What was the mood in the company at that time?

When the event occurred—
When the [specific event] happened, what do you recall about that time?
How were you informed? Did most people hear that way?
How did you react to the news of the upcoming [specific event]?
What incidents or events accompanied the [specific event]?
What did you think at that time? What seemed important or significant?
Why were these important or significant?
What concerned you or others at the time?
What questions do you remember having or asking?
What was being communicated at this time? By upper management?
    By your peers? By your manager?

Now that the event has occurred—
After some time has passed, what do you recall most?
What incidents or events do you recall?
What did you think at this time? What seemed or seems important or significant?
Why were these important or significant?
What concerned you or others at the time?
What questions do you remember having or asking?
What did the [specific event] overall signify to you? What did it mean?

Thinking back over your remarks—
Anything else of importance you'd like to add?
Anything that we didn't talk about that appears relevant?

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PERCEIVING AND INTERPRETING ENVIRONMENTAL CHANGE: AN EXAMINATION OF COLLEGE ADMINISTRATORS' INTERPRETATION OF CHANGING DEMOGRAPHICS

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This research examined the effect of organizational and resource dependence factors on college and university administrators' interpretation of an objectively verifiable environmental change: the decline in the number of 18–22-year-olds in the United States. Results indicated that these characteristics significantly affected the interpretation of changing demographics but explained relatively little variance in administrators' certainty about how to respond to a changed environment. The research suggests that examining the interpretation of specific environmental changes may be a useful way of gaining insight into the factors that influence the environmental interpretation process.

Organizational environments change constantly, posing an ongoing problem for top-level managers. In order to maintain a stable level of performance, managers must not only notice changes in their organizational environment but also decide whether those changes are important enough to merit some adaptation in the organization's strategy or design (Weick, 1987). The task of interpreting an environment is a highly ambiguous one that is complicated by the potential costliness of errors When managers misinterpret changes in their environment or fail to notice changes that turn out to be important, they may fail to make needed adjustments to an organization's strategy or structure (Pfeffer & Salancik, 1978). The ensuing lack of fit between the environment and the organization's strategy or structure may result in performance declines and other types of crises (Dunbar & Goldberg, 1978; Nystrom & Starbuck, 1984; Weick, 1987).

Although the processes of noticing and interpreting environmental changes are clearly critical to organizational performance and survival, relatively little research has investigated those processes (Daft & Weick, 1984;

Pfeffer & Salancik, 1978). The purpose of the research reported here was to begin to redress this lack of data by examining how organizational managers interpreted a major change in the demographic makeup of their customers. Specifically, this study examined college and university administrators' interpretation of the decline in the number of 18–22-year-olds in this country and explored the effects of resource dependence and organizational characteristics on the degree to which administrators experienced three types of environmental uncertainty (Milliken, 1987).

ENVIRONMENTAL INTERPRETATION AND TYPES OF UNCERTAINTY

Researchers have developed a number of models to describe the process by which decision makers notice and interpret issues and events in their environment (Cowan, 1986; Daft & Weick, 1984; Dutton & Duncan, 1987; Johnson, 1983; Kiesler & Sproull, 1982; Lyles & Mitroff, 1980). Although there are many underlying similarities in these models, they tend to use different labels for the processes they describe, including environmental interpretation, problem formulation, problem sensing, issue management, and strategic issue diagnosis. I chose Daft and Weick's model of environmental interpretation as the theoretical framework for this research because that model specifically focuses on describing the process by which managers perceive, interpret, and attempt to respond to changes in an organization's external environment.

Daft and Weick (1984) characterized the interpretation process in terms of three tasks. First, managers must scan an environment to collect data about actual or potential changes in it. Second, they must analyze and interpret the information collected during scanning in order to identify critical threats and opportunities. Third, they must take action that is based on those interpretations.

Each of the three tasks is extremely complex and likely to generate considerable uncertainty. However, the type of uncertainty managers experience is likely to vary as a function of the task. In a previous article (Milliken, 1987), I suggested that managers may experience at least three different types of environmental uncertainty as they seek to understand and respond to changes in an organization's environment. I called these types: state uncertainty, effect uncertainty, and response uncertainty. In the next sections, each uncertainty type is mapped onto the particular task it would tend to be associated with in the Daft and Weick framework.

Scanning

The purpose of scanning is to identify the key trends, changes, and events in an organization's environment that might affect the organization's functioning. *State uncertainty* occurs when managers do not feel confident that they understand what the major events or trends in an environment are or feel unable to accurately assign probabilities to the likelihood that particular events or changes will occur (Milliken, 1987). A manager might, for

example, be uncertain about whether a competitor will introduce a new product or about whether a proposed piece of legislation will pass.

As this research focused on one particular environmental change—the decline in the number of 18–22-year-olds—the issue of particular concern was whether or not college administrators noticed this change. In general, they were hypothesized to be quite certain about the occurrence of this change because it has been well-publicized and because changes in the age distribution of the population are a function of birthrates. In terms of this research, state certainty about this change was thus predicted to be high. In fact, the objective nature of the change provided an ideal context for studying variance in environmental interpretation.[1]

Interpretation

The environmental interpretation task involves identifying the key environmental threats and opportunities an organization faces (Dutton & Jackson, 1987), which requires that managers assess the meaning and significance of each change, event, and trend they noticed during the scanning phase.

One problem managers face as they try to interpret the meaning of an environmental change or event is that they can never be certain that they have interpreted changes correctly until after an accumulation of experience in the changed environment clarifies the correctness or incorrectness of their interpretations (Starbuck & Milliken, 1988). *Effect uncertainty* exists when managers are unsure about what effect an environmental event or change will have on their organization and thus are uncertain about whether a change poses a significant threat or opportunity for the organization (Milliken, 1987). Managers may need to resolve this uncertainty and become fairly certain that a change will affect their organization before they classify a change as a significant threat or opportunity. In terms of this research, effect certainty would have to be high for a change to be classified as a threat or opportunity.

In the case of the demographic change of interest here, administrators would experience high effect uncertainty if they were unsure about whether and how the decline in the number of 18–22-year-olds would affect their particular institution and thus were uncertain about whether the change represented a significant threat or strategic issue for the institution.

Responding

Daft and Weick (1984) used the term "learning" to describe the task of taking action in response to environmental changes. As managers try to decide how to respond to the changes and trends they have noticed and

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[1] As will be discussed, however, regional differences in the magnitude of the decline in 18–22-year-olds could cause administrators to have some uncertainty about the magnitude of the decline in their region.

analyzed, they may experience *response uncertainty* (Milliken, 1987). Response uncertainty is very similar to the uncertainty decision theorists have discussed (Conrath, 1967; Taylor, 1984). A high degree of response uncertainty indicates that a decision maker is not confident about how to respond to some environmental change, because he or she is either not sure what the response options are or is unsure about the likely effectiveness of each possible strategy for achieving desired organizational outcomes. College administrators would be high in response uncertainty if they were unsure about what strategies to pursue to counter the decline in the number of 18–22-year-olds. Conversely, administrators who were confident that they knew how to respond effectively to this environmental change would be classified as high in response certainty.

THE ROLE OF ORGANIZATIONAL CHARACTERISTICS IN SCANNING, INTERPRETING, AND RESPONDING TO ENVIRONMENTAL CHANGE

If all organizations responded to changes in their environments in the same way, there would be no need to examine the environmental interpretation process or the role of organizational characteristics in this process. However, there is evidence of tremendous differences in how managers respond to the same environmental conditions. Meyer (1982), for example, noted large differences across hospitals in how each responded to the "environmental jolt" created by a doctors' strike. The strike was an objective environmental event to which the administrators of various hospitals gave different meanings, and thus it elicited very different administrative responses. Meyer (1982) suggested that characteristics of an organization's ideology may significantly affect the environmental interpretation process. Other researchers have shown that both organizational characteristics and the characteristics of an individual perceiver influence how environmental conditions are perceived and interpreted (Downey, Hellriegel, & Slocum, 1977; Huber, O'Connell, & Cummings, 1975; Storey & Aldag, 1983).

Little is known, however, about how organizational characteristics influence the specific judgments managers make as they scan, interpret, and attempt to respond to particular changes in an organizational environment. For example, the structural and strategic characteristics of organizations may exert a stronger influence on the interpretation of environmental changes than they do on environmental perception. Because past studies of environment-organization relationships have not attempted to look at noticing, interpreting, and responding to environmental change as separate phenomena, they have not been able to shed light on exactly how organizational characteristics influence responses to environmental changes. Yet this knowledge could be useful in helping managers understand the types of problems they might encounter as they attempt to react to a changing environment.

The current study examined the effect of organizational and resource dependence characteristics on the amount of state, effect, and response un-

certainty college administrators reported in connection to changing demographics. Figure 1 outlines the basic research model tested in this study.

In the following section, the literature on each of these sets of variables is briefly reviewed and specific hypotheses about the effect of these variables on the environmental interpretation process are advanced.

Resource Dependence Characteristics

An environmental niche is said to be in a state of decline when there is a shrinkage in the pool of resources or a shift in the shape of a niche that changes the nature of available resources (Cameron, Kim, & Whetten, 1987). Obviously, a change in the size or shape of a niche will not affect all organizations equally. Organizations that are either very dependent on resources from a particular niche or that have very little power over resource suppliers are especially vulnerable to shrinkage in a pool of resources.

Daft, Sormunen, and Parks suggested that dependence translates routine uncertainties into "strategic uncertainties" (1988: 125). In terms of the current research, the extent of resource dependence is expected to influence whether managers will interpret a perceived change in resource levels as likely to have a significant effect on their organization. Potential students, the vast majority of whom are between the ages of 18 and 22, are obviously a critical resource for colleges and universities. The decline in the birthrate in the United States during the late 1960s and throughout the 1970s has resulted in a shrinking supply of 18–22-year-olds since 1983. The population of 18–22-year-olds is expected to decline by 25 percent before it stabilizes in the mid 1990s (Breneman, 1982; National Center for Educational Statistics, 1982). The extent of a college's dependence on the 18–22-year-old market niche and its power in that market seem likely to influence the degree to which its administrator will see this change as threatening to the college.

Thus, the resource dependence characteristics of colleges were hypothesized to influence administrators' interpretation of changing demographics—their level of effect certainty—but to have no effect on the likelihood of their noticing this change (their level of state certainty) or on their confidence in their ability to respond effectively (their level of response certainty).

> *Hypothesis 1a: The greater an organization's dependence on a particular pool of resources, the more likely managers will be to interpret a decline in the availability of that resource as a threat: the greater the resource dependence, the higher the effect certainty.*

> *Hypothesis 1b: Resource dependence will have no significant effect on whether managers will notice a change in resource availability or on their perceived capacity for responding: resource dependence will have no significant effect on state certainty or response certainty.*

FIGURE 1
Research Model
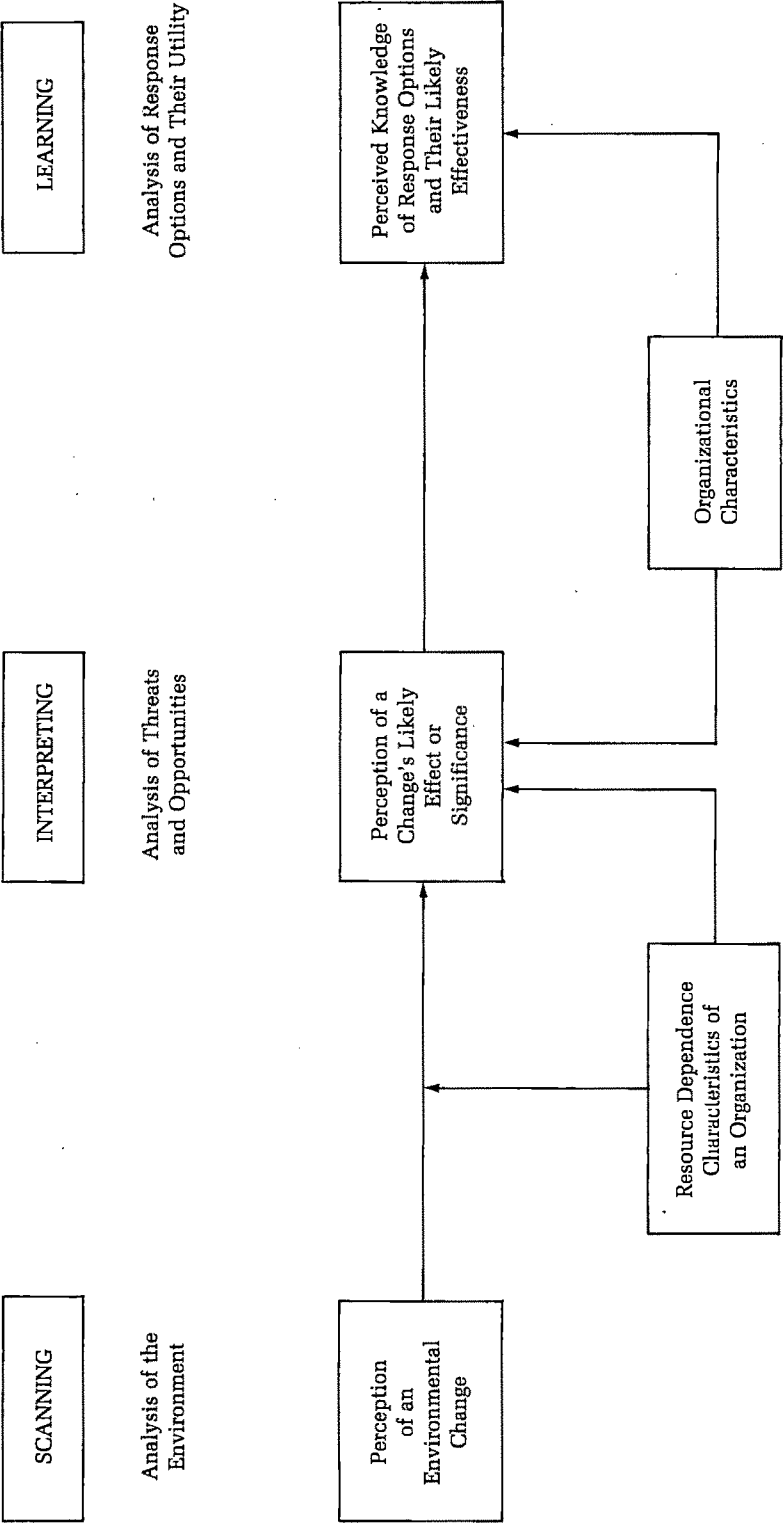
These hypotheses suggest that resource dependence characteristics have a direct effect on the interpretation of environmental change. An alternative hypothesis might be that they moderate the relationship between perceived state certainty and perceived effect certainty in such a way that managers who are certain about the occurrence of an environmental change will be more likely to interpret the change as a significant threat only when they belong to organizations that are highly dependent on the resource in question. Thus,

> *Hypothesis 1c: The resource dependence characteristics*
> *of an organization may act to moderate the relationship*
> *between state certainty and effect certainty.*

Perceived Organizational Characteristics

Organizational characteristics are also likely to influence the interpretation of environmental change (Meyer, 1982). These characteristics seem particularly likely to have an impact on effect certainty, the likelihood that managers will see environmental changes as significant. In addition, organizational characteristics may influence managers' confidence in their ability to respond effectively to a changed environment. In this study, I measured three organizational characteristics: perceived organizational effectiveness, perceived sense of organizational identity, and perceived extent of decentralization.

Perceived organizational effectiveness. Effectiveness is generally studied as an outcome variable, yet managers' perceptions of an organization's past or current effectiveness may also influence how they will interpret and respond to changes in their organization's environment. Managers who perceive their organizations as effective may be less likely to interpret environmental changes as threats, even though they may notice those changes. They may also tend to be more confident than other managers that their organizations will be able to respond effectively to changes. Some researchers (e.g., Tushman & Romanelli, 1985) have also suggested that managers of successful organizations may tend to become less vigilant in monitoring their environment, thereby reducing the likelihood that they will notice environmental changes. However, because the change studied here was so widely publicized, I did not predict that organizational effectiveness would have an effect on administrators' certainty about the occurrence of the changing demographics. Thus,

> *Hypothesis 2a: The more effective managers perceive an*
> *organization to be, the less likely they will be to perceive*
> *an environmental change as a threat: the higher the per-*
> *ceived effectiveness, the lower the effect certainty.*

> *Hypothesis 2b: The more effective managers perceive an*
> *organization to be, the more certain they will be of their*
> *ability to respond effectively to a change in the environ-*
> *ment: the higher the perceived effectiveness, the higher*
> *the response certainty.*

Perceived sense of institutional identity. Martin, Feldman, Hatch, and Sitkin (1983) suggested that an important component of organizational culture may be the strength of an organization's identity, or the degree to which its members perceive it to be unique or special. These perceptions may or may not reflect reality, but they will influence organizational members' attitudes and behavior in either case. To measure the extent to which perceived institutional uniqueness pervades the culture of an organization would obviously require testing multiple respondents and measuring agreement among them. However, it is also possible to measure the association between an individual's perceptions of institutional identity and an individual's interpretations of environmental change.

It was hypothesized that a strong sense of organizational identity would tend to be associated with a belief in the organization's relative invulnerability to environmental changes. Thus, administrators who strongly believe that their institution is unique or special ought to be less convinced than other administrators that the demographic trend of interest here represents a significant strategic issue or threat for their institution. Similarly, a belief that an institution is special may be associated with confidence in its ability to weather storms created by environmental changes.

> *Hypothesis 3a: The stronger the sense of organizational identity, the less likely managers will be to see an environmental change as a threat: the stronger the sense of identity, the lower the effect certainty.*

> *Hypothesis 3b: The stronger the sense of organizational identity, the more certain managers will be of their ability to respond effectively to an environmental change: the stronger the sense of identity, the higher the response certainty.*

Perceived decentralization. Several researchers have suggested that the structural characteristics of organizations may influence the amount of perceived environmental uncertainty (Huber, O'Connell, & Cummings, 1975; Leifer & Huber, 1977). For example, in a laboratory experiment Huber and his colleagues found that groups using mechanistic structures perceived more uncertainty than groups using organic structures.

Decentralization of strategic decision-making responsibilities allows managers to be exposed to the opinions of others who may be more active boundary spanners than themselves. These boundary spanners are likely to participate in external networks that exchange information about environmental trends and their potential significance. Thus, administrators in institutions with decentralized structures were hypothesized to be more certain that the decline in the number of 18–22-year-olds available to their school would occur, as well as more certain that the decline would represent a significant strategic issue for their institution. The exchange of ideas may also lead to more careful deliberation about response options and their likely

impact, thus facilitating the development of administrators' confidence in their institution's ability to respond effectively.

> *Hypothesis 4: The more participatory an organization's strategic planning process is, (a) the more likely managers will be to notice the occurrence of an environmental change: state certainty will be high; (b) the more likely managers will be to see an environmental change as significant: effect certainty will be high; and (c) the more certain managers will be about their organization's ability to respond effectively: response certainty will be high.*

Regional Differences in Interpretation

It is important to note that the 25 percent decline in the number of 18–22-year-olds is a national estimate based on averaging data on birthrates across states (Breneman, 1982). There are, however, large regional differences in birthrates. Additionally, a high immigration rate into some regions was predicted to partially offset the decline in the birthrate. Estimates made in the early 1980s suggested that the Northeast would be the hardest hit, with an expected 40 percent decline in the number of 18–22-year-olds by 1997 (Breneman, 1982), but that the Southwest, including Texas, Arizona, and Utah, would benefit from significant migration into the region. Thus, there might be no decline at all in the number of 18–22-year-olds in the Southwest. To the extent that most colleges and universities draw applicants from within their region, the location of a college should affect administrators' interpretations of the national estimate. Thus,

> *Hypothesis 5: Administrators of colleges located in regions of low decline will be less likely to interpret changing demographics as a threat.*

METHODS

Sampling

A random sample of 148 private, four-year liberal arts colleges was chosen and stratified to represent the distribution of colleges by region of the United States. I sent questionnaires to 589 top-level administrators in the winter of 1985. The sample included an average of four administrators from each of the 148 randomly selected colleges. Roles sampled included those of president; provost, or vice president for academic affairs; vice president for strategic planning; vice president or dean of admissions; and vice president for finance; a small number of other administrative roles were also sampled.

Of the 589 questionnaires sent out, 211 usable questionnaires from individuals representing 122 colleges and universities were returned, a response rate of approximately 36 percent. The number of respondents per institution ranged from 1 to 4 with an average of 1.7. The pattern of responses by region closely resembled the actual regional distribution of the population of liberal arts colleges. Additionally, a comparison of the char-

acteristics of responding institutions with those of nonresponding institutions (e.g., size, age, and the existence of graduate programs) revealed no significant differences.

An analysis of response rates by role revealed that presidents and executive vice presidents were less likely to respond (22%) than were other administrators (41%). However, a statistical analysis of differences in perceptions by role and by such individual demographic factors as institutional and role tenure revealed no significant differences.

Measurements

Types of certainty. Respondents were asked to estimate the probability of the occurrence of the demographic trend of interest here—objectively, it was 100 percent—and the probability of that trend's affecting their particular institution. Using a methodology similar but not identical to that used by Duncan (1972) to measure uncertainty, I developed composite ratings for state certainty and effect certainty. The questions used to assess these two types of certainty appear in the Appendix. A key difference between Duncan's measure and the measures used here is that I assessed each type of uncertainty independently, whereas Duncan aggregated all his items into a summative index of perceived environmental uncertainty.

Another key difference between Duncan's measures and mine lies in how the probability estimates and confidence estimates were combined. In this study, I did not rate those variables on a continuum from maximum uncertainty to maximum certainty but rather on continua whose low ends represented certainty of nonoccurrence or certainty of no effect and whose high ends represented certainty of occurrence and certainty of effect. This adaptation of Duncan's scoring system was necessary because the primary focus of this study was on perceptions and interpretations of a particular change in an environment, not on global attributes of the environment. Thus, it was critical to be able to differentiate individuals who were certain that the change would have no effect on their institution from those who were equally certain that the change would have an enormous effect. Rating this variable on an uncertainty-to-certainty continuum would have collapsed those two very different types of certainty into one because an assignment of a 0-percent probability to a trend's occurrence or likelihood of effect is equal in terms of certainty to an assignment of a 100-percent probability.

It was assumed that the effect certainty score, which I weighted by a factor for perceived magnitude of effect, was a reasonable surrogate for the degree to which administrators saw the trend as a potential strategic issue for their institution.

Respondents were also asked to indicate how certain they were about their institution's ability to respond effectively. I based the six-item scale (see the Appendix) used to measure response certainty on Conrath's conceptualization of uncertainty (1967). The scale was found to have an acceptable level of reliability ($\alpha = .75$).

Resource dependence factors. I defined resource dependence character-

istics as factors that made a college or university more or less dependent than
its competitors on the pool of 18–22-year-old recent high school graduates
or that made it more or less powerful than its competitors in securing re-
sources from this pool. Two resource dependence factors were examined: an
institution's selectivity in choosing students and its dependence on under-
graduate programs.

The more selective an institution is, the greater its capacity to attract
students relative to less prestigious schools. Highly selective colleges have
power in the market for students and are less likely to suffer enrollment
declines than nonselective schools during a period of shrinkage in the re-
source supply. I defined selectivity as the ratio of the total number of appli-
cants to the number of accepted applicants.

The extent of an institution's dependence on undergraduate programs
was measured by computing the number of students enrolled in undergrad-
uate and graduate programs and dividing by the number of graduate stu-
dents. The rationale was that colleges and universities with a large number
of graduate students are likely to be less dependent on the 18–22-year-old
population for students because graduate programs generally attract stu-
dents of varying ages. The measure was reverse-scored to capture the extent
of a college's dependence on its undergraduate programs. Data on selectivity
and number of undergraduate and graduate students were obtained from the
College Board's data base on institutions of higher education (College Board,
1984).

Perceived organizational characteristics. Participation in strategic de-
cision making was measured by an eight-item scale adapted from the Man-
agement System Questionnaire (Keller, Slocum & Susman, 1974). As this
study dealt with top-level administrators and strategic decision making, I
adapted the centralization scale to measure the degree to which an institu-
tion's structure supported administrative participation in key decisions.
Psychometric analyses revealed that the adapted scale had a coefficient al-
pha of .89 and an average item-total correlation of .67. Items included: "The
president or board of trustees usually makes the strategic decisions for the
college without consultation with other administrators" (reverse-scored)
and "When the institution is facing a tough problem, administrative task
forces are often convened to study potential solutions to the problem and to
make recommendations to the president."

To measure the sense of uniqueness characterizing an institution's cul-
ture (Martin et al., 1983), I developed a new scale for this research. The scale
originally had eight items, but I omitted two items found to have low item-
total correlations. For the six-item version of this scale, $\alpha = .79$ and the
average $r = .55$. The scale appears in the Appendix.

Perceived organizational effectiveness was measured by 14 items taken
from Cameron's more comprehensive measure of effectiveness (Cameron,
1978). The coefficient alpha for the reduced scale was .92. Items asked re-
spondents to estimate the proportions of faculty members who had a na-
tional reputation in their field, who had published at least one book or article

in a professional journal in the last year, and who were doing active research. They were also asked to indicate the estimated proportion of students for whom the school was their first choice and other questions assessing the college's academic effectiveness.

Data Analysis

First, the pattern of correlations was examined as a preliminary test of some of the bivariate hypotheses. Then, I used multiple regression analyses to examine the relative contributions of each of the independent variables to the explanation of variance in effect certainty and response certainty. I assessed the effect of regional differences on each of the three types of uncertainty using an analysis of variance procedure. When such analyses proved significant, I entered region as a control variable in the appropriate regression equations. Finally, a moderated regression analysis was used to test for the possible moderating effect of resource dependence variables on the relationship between state certainty and effect certainty.

RESULTS

Table 1 presents descriptive statistics and correlations for all the variables in the study. In order to test the hypothesized relationships meaningfully, it was first necessary to establish that the types of uncertainty were, in fact, differentiable. An examination of the correlation matrix reveals that though state certainty and effect certainty were positively correlated, state certainty explained less than 9 percent of the variance in effect certainty. Thus, variance in how environmental changes are interpreted cannot be wholly attributed to differences in environmental perception. Table 1 also shows that no relationship emerged between state certainty and response certainty, suggesting that merely perceiving the existence of an environmental change does not help to clarify strategic options for responding to the change. The significant negative relationship between effect certainty and response certainty suggests that the more certain managers are that they are facing a significant threat, the less sure they are of their ability to respond effectively. In general, the pattern of these results suggests that there are meaningful distinctions between the three types of uncertainty.

Another preliminary analysis involved assessing the effect of a college's location on administrators' perceptions and interpretation of the changing demographics. The results of an analysis of variance test revealed that, as hypothesized, region was a significant predictor of effect certainty ($F = 2.91$, $p < .01$) but that it did not affect certainty about the occurrence of the change (state certainty, $F = 0.25$) or about how to respond (response certainty, $F = 0.82$). Further analysis of means with Duncan's test revealed that administrators from institutions in the Southwest were significantly less certain that the demographic changes would affect their institutions than were individuals from other regions. This finding is consistent with demographic forecasts suggesting that the Southwest would experience little or no decline in

TABLE 1
Descriptive Statistics and Correlations Among Variables[a]

Variables[b]	Means	s.d.	n	1	2	3	4	5	6	7	8
1. State certainty	216.3	140.2	210								
2. Effect certainty	138.8	178.0	210	.25							
3. Response certainty	18.4	3.9	202	.09	-.01						
4. Selectivity	76.0	17.6	189	-.01	-.27	.08					
5. Undergraduate dependence	0.1	0.1	208	-.02	.17	.04	-.35				
6. Decentralization	33.3	5.8	200	.16	-.06	.13	.03	.05			
7. Sense of institutional identity	24.8	3.7	207	.13	-.18	.16	.15	.06	.40		
8. Perceived effectiveness	37.1	14.5	151	.11	.33	.14	.44	.32	.40	.33	

[a] Correlations with values above .15 are significant at the .05 level, those above .18 are significant at the .01 level, and those above .24 are significant at the .001 level. The correlation matrix reflects listwise deletion of missing data; n = 155.

[b] The means and standard deviations for the various types of certainty cannot be compared to each other as they are not standardized.

the number of 18–22-year-olds. Because of these regional differences in interpretation, I introduced region, dummy-coded as 1 = Southwest and 0 = all other regions, as a control variable in the regression equations that sought to predict variance in effect certainty.

The Role of Resource Dependence in Environmental Interpretation

Hypotheses 1a and 1b posited that an institution's resource dependence characteristics would be significantly related to perceived effect certainty but not to state certainty or response certainty. Examination of the correlations between the resource dependence variables and each of the types of certainty judgments suggests preliminary support for this hypothesis. The more selective an institution was, the less the decline in the number of 18–22-year-olds threatened its administrators ($r = -.27, p < .001$). In contrast, dependence on undergraduate programs was associated with higher levels of effect certainty ($r = .17, p < .05$). Neither measure of resource dependence was related to levels of state certainty or response certainty. Thus, as hypothesized, resource dependence factors appear to affect how environmental changes will be interpreted, not whether they are noticed or whether managers will know how to respond.

In addition to correlational analyses, this study employed moderated regression analyses to explore whether resource dependence characteristics moderated the relationship between noticing a change and interpreting the change as significant. Table 2 presents results of these analyses, which indicated that administrators were more likely to perceive the changing demographics as threatening when they saw those changes as certain to occur and belonged to institutions that either depended on undergraduate programs or had little power to secure students from the shrinking pool of 18–22-year-olds. However, a hierarchical analysis revealed that the interaction term (state certainty × resource dependence) did not add significantly to the explained variance in effect certainty. Thus, although resource dependencies appear to influence the interpretation of changing demographics, they do not appear to moderate the relationship between state and effect certainty.

Multiple regression analyses were also used to explore whether resource dependencies explained unique variance in environmental interpretations. Table 3 presents the results of this analysis, which generally show that the resource dependence variables explain relatively little variance in either effect or response certainty when their unique contributions are assessed. Resource dependencies' lack of effect on response certainty is in keeping with this study's hypotheses, but their lack of relationship with effect certainty is inconsistent with both the hypotheses and the correlational results. In the case of selectivity, it appears that the lack of significant results may be partially attributable to this variable's correlation with the perceived effectiveness measure. Model 2 in Table 3 shows that when effectiveness is re-

TABLE 2
The Moderating Effect of Resource Dependence Characteristics on the Relationship Between State Certainty and Effect Certainty[a]

Resource Dependencies	Independent Variables[b]	Multiple Regression Model		Hierarchical Analysis	
		R	F	R^2	F
Selectivity	State certainty	.285	18.24***	.067	13.07***
	State certainty + selectivity	.310	9.69***	.030	5.95*
	State certainty + selectivity + interaction term	.315	6.68***	.003	0.64
Undergraduate dependence	State certainty	.285	18.24***	.067	13.07***
	State certainty + undergraduate dependence	.283	7.55***	.014	2.70†
	State certainty + undergraduate dependence + interaction term	.293	5.68***	.006	1.14

[a] The n for the moderated regression model is 184.
[b] The interaction term combined the resource dependence characteristic and state certainty.
    † $p < .10$
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

moved from the analysis, selectivity becomes a marginally significant predictor of the degree to which administrators see the changing demographics as a threat.

The Role of Organizational Characteristics in Environmental Interpretation

The second set of hypotheses (2–4) posited that administrators' assessments of organizational characteristics would also affect their interpretation of the demographic changes of interest. A preliminary analysis of the correlational data presented in Table 1 reveals support for most of the hypothesized relationships. Administrators who perceived their institutions as effective and as having a strong institutional identity tended to be less convinced that the changing demographics would affect their institution (r's = −.33 and −.18, $p < .05$) and more certain that the institution would be able to respond effectively (r's = .24 and .16, $p < .05$). As predicted, neither

TABLE 3
Results of Multiple Regression Analysis[a]

Variables	Effect Certainty				Response Certainty			
	Model 1		Model 2		Model 1		Model 2	
Region[b]	−.245**	(.076)	−.269***	(.071)				
Selectivity	−.119	(.082)	−.138†	(.076)	−.020	(.092)	.046	(.083)
Undergraduate dependence	.027	(.081)	.052	(.077)	.136	(.089)	.114	(.082)
Decentralization	.032	(.083)	.011	(.076)	−.007	(.093)	.070	(.082)
Sense of institutional identity	−.109	(.088)	−.167*	(.077)	−.008	(.098)	.130	(.084)
Perceived institutional effectiveness	−.147	(.110)			.235*	(.119)		
State certainty	.285***	(.072)	.229***	(.070)	.115	(.083)	.064	(.078)
Effect certainty					−.161†	(.088)	−.178*	(.081)
Response certainty	−.165*	(.074)	−.173*	(.071)				
R	.53		.48		.31		.29	
Adjusted R^2	.24		.20		.06		.05	
F	7.02***		7.08***		2.30*		2.59*	
df	8,146		7,162		7,147		6,163	

[a] Standardized regression weights are reported with standard errors in parentheses.
[b] Region was a control variable for effect certainty only.
 † p < .10
 * p < .05
 ** p < .01
 *** p < .001

effectiveness nor sense of institutional identity was related to the likelihood that administrators had noticed the change in demographics. Contrary to the study's predictions, decentralization was not related to perceived effect certainty ($r = -.06$) or to response certainty ($r = .13$). However, decentralization had a small, positive relationship to the likelihood that an environmental change had been noticed ($r = .16$, $p < .05$).

The results of the multiple regression analyses were not entirely consistent with the results of the correlational analyses. As can be seen from the coefficients for Model 1 (Table 3), none of the organizational variables explained a significant amount of variance in effect certainty, although all the betas were in the predicted direction. In the case of response certainty, only perceived effectiveness contributed significantly to the explained variance.

The inconsistencies in the results of these analyses raised the concern that multicollinearity among the independent variables might be affecting the results of the regression analysis. An examination of the correlation matrix (Table 1) revealed that the perceived effectiveness measure was significantly correlated with each of the other organizational and resource dependence characteristics (r's $= .32–.53$). Although none of these correlations is particularly high, several writers (e.g., Cohen & Cohen, 1985; Lewis-Beck, 1980) have argued that multicollinearity can be a serious problem even

though individual r's are low, particularly when there are several significant values. In fact, a multiple regression analysis predicting perceived effectiveness from the other independent variables was highly significant ($R = .80$, $F = 47.25$, $p < .0001$). Although writers have tended to agree that there is no ideal solution to this problem, most have counseled that researchers ought to make some attempt to correct it (Cohen & Cohen, 1985; Lewis-Beck, 1980; Pedhazur, 1982). One solution is to remove the problematic independent variable from the analysis (Lewis-Beck, 1980; Pedhazur, 1982; Schroeder, Sjoquist, & Stephan, 1986).

Model 2 in Table 3 shows the results of a regression analysis with effectiveness removed from the equation. The results of the reconstructed equation predicting effect certainty indicated that administrators were more likely to perceive changing demographics as a threat when they were certain the change would occur and would continue, when they came from institutions in regions expected to be vulnerable to the decline, and when they did not feel confident about their organization's response capability. Additionally, administrators who represented colleges with little market power and who perceived their colleges as lacking a strong institutional identity were more likely to see the changing demographics as a significant threat.

The results of the regression equations predicting response certainty suggest that administrators tend to be more certain about how to respond to a changed environment when they attach little significance to a change. Additionally, Model 1 suggests that the past effectiveness of an institution may influence administrators' confidence in their response capability. When effectiveness is not in the equation (Model 2), organizational characteristics have no significant effects on response certainty.

DISCUSSION

The fundamental purpose of this research was to investigate top-level managers' perception of, interpretation of, and responses to a change in their organization's environment.

To define those different judgmental tasks, I measured three types of uncertainty. The findings suggest that the three types of uncertainty used here and proposed in previous work (Milliken, 1987) are, in fact, differentiable. Therefore, it appears that managers can experience several different types of uncertainty as they attempt to adapt an organization to its environment. One implication of these findings is that aggregating uncertainty scores into a global measure of perceived environmental uncertainty, as has past research (e.g., Downey et al., 1977; Duncan, 1972), may mask significant differences between types of uncertainty. Such a masking of differences may be of particular concern when the goal of research is to understand the process of environmental interpretation.

The current results also offer empirical support for Daft and Weick's (1984) proposition that organizational adaptation involves three distinct tasks—scanning, interpreting, and learning. To the extent that the different

types of certainty judgments are, in fact, linked to managers' experiences of these different tasks, it seems reasonable to argue that the tasks are empirically distinct from one another.

This research also sought to investigate how resource dependence and organizational characteristics influence administrators' interpretation of and responses to an environmental change. The results suggest that an organization's resource dependencies may be a significant determinant of how environmental changes are interpreted but that they do not have a significant effect on administrators' certainty about the state of their environment or about how to respond to a changing environment. This pattern of results makes intuitive sense since the extent of dependence is likely to be a key factor in determining the degree of organizational vulnerability to a decline in resource availability. Dependence in a sense determines the degree of implied risk for an organization when a major change occurs in a niche's size or shape.

The research also suggests that organizational characteristics, as perceived by an organization's managers, affect the environmental interpretation process. Administrators' perceptions of their organization's effectiveness, for example, may influence their interpretation of environmental changes. This result supports the findings of a study by McCabe and Dutton (1989) that found effectiveness to be a major predictor of perceived environmental uncertainty among managers. Additionally, the findings of a regression analysis omitting the effectiveness variable showed that the perceived strength of an institution's identity may also influence interpretation of its environment, but the effect was masked because this variable shared variance with perceived effectiveness. Future research might consider using a path analytic model to help clarify these relationships.

In general, the results of the current research are consistent with those of previous research indicating that organizational characteristics influence the environmental perception process (Huber et al., 1975; Leifer & Huber, 1977). This study, however, draws attention to the possibility that organizational characteristics influence the specific tasks involved in environmental interpretation in different ways. For example, administrators who perceive their organizations as having a strong sense of identity and as effective may tend to be less certain than administrators in other circumstances that environmental changes are threatening: for the former, effect certainty is low. They may also be more certain of their organization's ability to adapt effectively to environmental changes, or have high response certainty. To the extent that their perceptions accurately reflect reality, it is not irrational for managers of effective organizations to perceive environmental changes as less threatening to organizational survival than managers of ineffective organizations. However, this relationship also suggests a path to crisis if managers have a distorted perception of reality and their organization is not as insulated from the effect of environmental changes as they think. Consistent failures to respond to environmental changes because they are not seen as

significant can, over time, make even a highly effective organization ineffective.

It is also worth noting that the set of resource dependence and organizational variables did a much better job of explaining variance in effect certainty than they did in predicting administrators' levels of response certainty. Specific planning procedures and processes may influence managers' certainty about how to respond to a changed environment more significantly than do general organizational features. For example, such factors as whether an organization has undertaken a competitive analysis and whether it has a strategic planning process in place may influence response certainty.

In summary, although management researchers have many theories that emphasize the importance of the environmental scanning and interpretation processes, relatively few studies have examined those processes. Yet it seems important to try to examine empirically how organizational sensemaking and response systems work. Such research may improve our understanding of some of the reasons why organizations fail to adapt effectively to environmental changes.

The interpretation step may be particularly critical to understanding differences in how organizations respond to their environment. To understand environmental interpretation, however, researchers need to conduct studies that effectively hold the objective conditions of an environment constant so that they can study true variance in interpretation rather than variance muddied by potential differences in objective environmental conditions. This study suggests a theoretical frame for such research as well as an approach to undertaking field studies of environmental interpretation.

Investigating factors that influence the environmental interpretation process may ultimately lead to a better understanding of why two or more organizations can be differentially effective even though the environmental changes they face are virtually the same. Clearly, however, more research in this area is needed to explain how the environmental interpretation process works. I interpret this need as a major opportunity for researchers.

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APPENDIX

The measures that appeared on the questionnaire were worded as follows:

State Certainty

A 15–25% decline in the number of 18–22-year-olds in this country has been predicted for the time period from 1983–1997.

If you had to assign a probability as to the likelihood that this decline will occur, what would it be? (0–100%)

How certain are you of your estimate? (1 = extremely uncertain, 7 = extremely certain)

Effect Certainty

How likely is it (in your estimation) that your institution will be affected by this decline? (0–100%)

How certain are you of this estimate? (1 = extremely uncertain, 7 = extremely certain)

How much of an impact do you think this decline will have on your institution? (1 = no impact at all, 7 = extremely significant impact)

How certain are you of this estimate? (1 = extremely uncertain, 7 = extremely certain)

Response Certainty

Responses were on a 5-point scale with 1 = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, and 5 = strongly agree.

When weighing the various alternatives for responding to this trend, it is hard to decide which of these alternatives is likely to be most effective in the long run (reverse-scored).

I feel confident that we are aware of all the response alternatives available to us as an institution.

One cannot accurately assess the relative effectiveness of various alternatives because there are so many unknowns that can influence the effectiveness of each alternative (reverse-scored).

In the face of this demographic trend, to some extent administrators just have to guess which strategy will produce the most desirable outcome for the college (reverse-scored).

It is difficult to determine exactly what alternatives are available for responding to this change (reverse-scored).

Once the alternatives have been narrowed down, it is relatively easy to evaluate the desirability of each for the long-run well-being of the institution.

Institutional Identity

Responses were on the scale used for the response certainty items.

The institution does not seem to have a strong sense of its history (reverse-scored).

There is a strong sense of pride in the college's goals and mission among the administrators.

The administrators here think that this college has carved out a unique place for itself in the higher education community.

The college does not have a well-defined set of goals or objectives for itself (reverse-scored).

Administrators of this institution tend to be knowledgeable about the institution's history.

When administrators, faculty or students talk about the college to outsiders, it is usually with great enthusiasm.

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EFFECTS OF RACE ON ORGANIZATIONAL EXPERIENCES, JOB PERFORMANCE EVALUATIONS, AND CAREER OUTCOMES

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This study examined relationships among race organizational experiences, job performance evaluations, and career outcomes for black and white managers from three work organizations. Compared to white managers, blacks felt less accepted in their organizations, perceived themselves as having less discretion on their jobs, received lower ratings from their supervisors on their job performance and promotability, were more likely to have reached career plateaus, and experienced lower levels of career satisfaction. We examined direct and indirect effects of race on job performance evaluations and career outcomes. Suggestions regarding areas for future research are offered.

The number of black people occupying managerial positions in the United States has grown considerably in recent years. The percentage of managers who are members of minority groups increased from 3.6 percent of the national total in 1977 to 5.2 percent in 1982 (Jones, 1986), and in 1986 blacks represented 6 percent of all managers (Williams, 1987). Despite these recent gains, however, many observers have commented on the presence of an invisible barrier, or "glass ceiling," that prevents blacks (as well as members of other minority groups and women) from advancing beyond lower- or middle-management positions (Crotty & Timmons, 1974; Davis & Watson, 1982; Dickens & Dickens, 1982; DiTomaso, Thompson, & Blake, 1986; Jones, 1986; Morrison, White, & Van Velsor, 1987). Thus, although blacks have gained greater access to managerial jobs, there is still cause for concern that black managers may face "treatment discrimination."

Unlike "access discrimination," which prevents members of a subgroup of the population from entering a job or an organization, treatment discrimination occurs when subgroup members receive fewer rewards, resources, or

opportunities on the job than they legitimately deserve on the basis of job-related criteria. Thus, such discrimination represents a situation in which the treatment of employees is based more on their subgroup membership than on their merit or achievements (Levitin, Quinn, & Staines, 1971). Treatment discrimination can affect not only such tangible phenomena as position assignments, training opportunities, salary increases, promotions, terminations, and layoffs, but also such subtle issues as acceptance into a work group or the availability of career-enhancing and psychosocial support from supervisors and others (Ilgen & Youtz, 1986). In effect, subgroup members who are exposed to treatment discrimination encounter organizational experiences that are less favorable to their careers than are the experiences members of a dominant group encounter within an organization.

In an early theoretical examination of organizational discrimination, Kanter (1979) argued that minority members, women, and other token employees have low access to opportunity and power within organizations. She viewed opportunities as growth prospects stemming from a present job and suggested that employees with restricted opportunities ultimately lower their aspirations and commitment and engage in behaviors that reinforce negative opinions about their potential contributions to an organization. Additionally, restricted access to power—through routine task assignments or exclusion from informal social networks—produces a cycle of disadvantage for minority members who are unable to influence organizational actions or the course of their own careers (Kanter, 1979). Kanter suggested that the provision of less favorable experiences and opportunities for minority employees than for nonminority employees indicated institutional racism in organizations.

Much of the prior empirical research on treatment discrimination has focused on the experiences of working women. There is evidence of discrimination against women in compensation (Levitin et al., 1971; Terborg & Ilgen, 1975), prospects for promotion (Olson & Becker, 1983; Stewart & Gudykunst, 1982), assignments to challenging tasks (Mai-Dalton & Sullivan, 1981; Terborg & Ilgen, 1975), access to authority and responsibility on the job (Harlan & Weiss, 1982; Wolf & Fligstein, 1979), and opportunities to cultivate developmental relationships with mentors, sponsors, and peers (Fernandez, 1981; Rosen, Templeton, & Kichline, 1981).

Applying the research findings on gender discrimination to racial minorities, Ilgen and Youtz (1986) suggested that minority members may experience treatment discrimination in a number of respects and that such unfavorable experiences can have dysfunctional consequences for their career success. Specifically, those authors posited that treatment discrimination experienced by minorities may reduce their job performance and career prospects, since they would receive fewer opportunities to enhance work-related skills and develop supportive relationships within an organization than other employees. These lost opportunities, which may be reflected in the absence of a powerful sponsor or the assignment of routine tasks, can depress minority employees' ability, motivation, or both, and thereby di-

FIGURE 1
Proposed Relationships
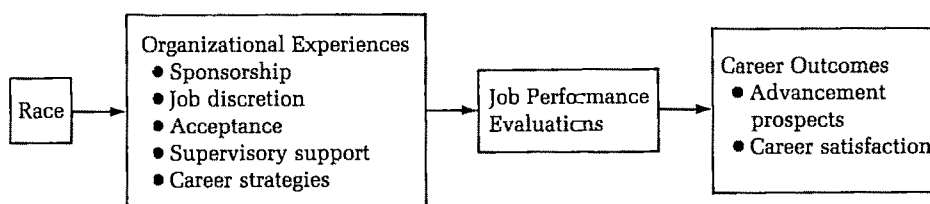
minish the effectiveness of their job performance. In effect, Ilgen and Youtz (1986) proposed that race differences in job performance can be explained— at least in part—by the differential treatment people in different groups experience. Those authors further suggested that minority members may internalize an organization's negative evaluations of them and engage in "self-limiting behaviors"—for example, refusing a challenging job assignment or declining an opportunity for additional training—that perpetuate performance differences between minority and nonminority employees.

There is considerable evidence that raters evaluate the job performance of blacks less favorably than the job performance of whites, especially when the raters are themselves white (Kraiger & Ford 1985). There is also evidence that black managers experience restricted advancement opportunities (Alderfer, Alderfer, Tucker, & Tucker, 1980; Brown & Ford, 1977; Fernandez, 1975; Irons & Moore, 1985; Nixon, 1985a) and report extensive dissatisfaction and frustration with their careers (Fernandez, 1985; Jones, 1986). However, the role of organizational experiences in producing these negative outcomes remains largely unexplored. The present research was conducted to address that gap in the literature on black managers' careers.

Specifically, the goal of this study was to examine relationships among race, organizational experiences, job performance evaluations, and career outcomes. Figure 1 presents the conceptual model examined in this study. The model, which builds on the work of Ilgen and Youtz (1986) and Kanter (1979), posits that race influences job performance evaluations through its effects on the organizational experiences of black and white managers. In other words, organizational experiences mediate (James & Brett, 1984) the relationship between race and job performance evaluations. We posited that job performance evaluations in turn influence two important career outcomes—advancement prospects and career satisfaction. Thus, in the model we also propose that organizational experiences and job performance evaluations mediate the impact of race on career outcomes.

PROPOSED RELATIONSHIPS AND EFFECTS

The Impact of Race on Organizational Experiences

The first linkage shown in Figure 1 is between race and a series of organizational experiences. Each of the five experiences examined in this

study is a potential indicator or product of treatment discrimination. Sponsorship represents an aspect of an organization's opportunity structure (Kanter, 1979) that can foster career growth (Kram, 1985; Roche, 1979). Both Ilgen and Youtz (1986) and Kanter (1979) suggested that minority members are less likely than others to have access to these resources because potential sponsors or mentors, most of whom are likely to be white, tend to choose protégés who are similar to themselves in social background and with whom they can more readily identify. Although the prior research on sponsorship opportunities for black managers has yielded mixed results (Thomas & Alderfer, 1989), small samples or other methodological problems have plagued many of these studies. In line with the reasoning of Ilgen and Youtz (1986) and Kanter (1979), we predicted that black managers experience less extensive sponsorship opportunities than white managers.

Managers' careers may also be enriched by supportive relationships with their immediate supervisors (Baird & Kram, 1983). Such support may take the form of career guidance and information, performance feedback, and challenging work assignments that promote development. There is some indirect evidence that black managers receive relatively little career support from their supervisors. For example, Jones (1986) reported that only 15 percent of the blacks in his sample described their organizational climates as supportive for black managers. Moreover, black managers are less likely than white managers to feel that they have been provided with important career-related information (Alderfer et al., 1980; Fernandez, 1981). In light of these findings, we predicted that we would find that black managers received less extensive career support from their supervisors than white managers.

Kanter (1979) identified the amount of discretion a job occupant exercises as an important indicator of the individual's potential to have power within an organization and posited that power differentials are one aspect of the presence of institutional racism. Minority members may experience low levels of job discretion and influence as a result of their status as outgroup members in their organizations (Ilgen & Youtz, 1986). Fernandez (1975, 1981) presented evidence suggesting that black managers possess less power, discretion, and autonomy in their jobs than their white counterparts. In a similar vein, Slocum and Strawser (1977) observed that black certified public accountants (CPAs) reported greater deficiencies in the satisfaction of their needs for autonomy than white CPAs. Thus, we expected to find that black managers experienced less discretion in their jobs than white managers.

Relationships in informal social networks have also been identified as important factors likely to influence organizational advancement and promotion (Kanter, 1979; Tsui, 1984). Moreover, Ilgen and Youtz (1986) suggested that minority members, as outgroup members, may not be fully accepted into the informal networks in their organizations. Consistent with this reasoning is Nixon's (1985b) finding that 56 percent of the black managers in her sample perceived themselves as either partially or totally alienated from the formal or informal aspects of corporate life. Similarly, Fernan-

dez (1981) observed that many blacks believe that minority managers are likely to be excluded from informal work groups. Moreover, black managers have been reported to be less optimistic than whites about interpersonal relationships between blacks and whites in their organizations (Alderfer et al., 1980). Therefore, we predicted that black managers feel less accepted in their organizations than white managers.

Recent research has confirmed the importance of career strategies in promoting high levels of career success (Gould & Penley, 1984). Career strategies like seeking visible job assignments and working long hours can help employees reach their career goals and test the appropriateness of those goals (Greenhaus, 1987). However, subgroup members who are persistently exposed to unfavorable treatment may avoid success-producing activities and instead engage in self-limiting behavior (Ilgen & Youtz, 1986; Kanter, 1979). It is possible, therefore, that black managers display a less active approach to the management of their careers than their white counterparts. Although successful black managers have advocated an assertive approach to career management (Leinster, 1988), blacks who perceive their organizations as hostile and inequitable (Bhagat, 1979) and who have internalized their organizations' negative assessments of themselves (Ilgen & Youtz, 1986) may not see the benefit of engaging in career strategy behaviors. Thus, we predicted that we would find that black managers engaged in less extensive career strategy behaviors than white managers.

Organizational Experiences and Job Performance Evaluations

As noted earlier, black employees tend to receive lower ratings of job performance than white employees (Kraiger & Ford, 1985). Although some portion of the race difference in rated job performance may be attributed to rater bias, it is also possible that there are race differences in actual job performance. Ilgen and Youtz (1986) suggested that race differences in actual job performance may be due to pervasive differential treatment minorities experience within organizations. Disparate treatment that results in fewer and less favorable opportunities for minority members with regard to sponsorship, supervisory support, job discretion, and acceptance can affect their subsequent performance in a number of ways (Ilgen & Youtz, 1986).

For example, the assignment of routine, nonchallenging tasks, the lack of supervisory interest in a subordinate's career aspirations, and the infrequent provision of performance feedback are likely to stunt a manager's professional growth on the job (Greenhaus, 1987); an attendant decline in the manager's job performance is likely to occur. Moreover, a manager with little job discretion or autonomy has few opportunities to exercise decision-making skills that promote effective job performance, may display low levels of work motivation (Hackman & Oldham, 1976), and may be seen by the organization as ineffective (Kanter, 1979). In addition, the absence of a sponsor and exclusion from an organization's informal networks can restrict the resources available to managers to help them perform effectively on their jobs. Finally, since career strategy behaviors can provide focus to managers'

efforts and increase the visibility of their accomplishments, low levels of participation in such activities can detract from job performance (Greenhaus, 1987). For these reasons, we predicted that the extensiveness of sponsorship opportunities, level of supervisory career support, feelings of organizational acceptance, degree of perceived job discretion, and participation in career strategy behaviors are all positively related to supervisory evaluations of managers' job performance.

Job Performance Evaluations and Career Outcomes

Career outcomes may be viewed from both an external perspective, as judged by an organization, and from an internal perspective, as judged by an employee (Schein, 1978). The present research examined two types of career outcomes identified as important in the literature on careers (Ference, Stoner, & Warren, 1977; Greenhaus, 1987; Hall, 1976). Managers' advancement prospects represent an externally defined career outcome, whereas managers' level of career satisfaction is an internally defined career outcome.

The model shown in Figure 1 proposes relationships between job performance evaluations and each type of career success outcome. We predicted a positive relationship between managers' job performance evaluations and the favorability of their advancement prospects. This prediction is based on the observation that the appraisal of current job performance often plays a significant role in an organization's assessment of an employee's promotability (Mobley, 1982; Stumpf & London, 1981). The model also predicts a positive relationship between managers' job performance evaluations and their level of career satisfaction. Supervisors who hold a negative view of a manager's job performance may give that individual smaller salary increments, less interesting assignments, and less recognition than other employees, all of which can detract from the manager's career satisfaction. Low levels of rated job performance, in other words, may restrict the frequency and magnitude of rewards received by a manager; this in turn, affects the manager's level of satisfaction (Porter & Lawler, 1968).

The present research was designed to contribute to the literature in several respects. First, this study compared the organizational experiences, job performance evaluations, advancement prospects, and career satisfaction of black and white managers. Although prior research has examined race differences in some of these variables, the present study represents a more comprehensive and integrated investigation of the role of race in the career-related experiences of black and white managers.

Second, the predicted relationships, taken together, represent linkages in a causal model that can explain race differences in job performance evaluations and career outcomes. Thus, an empirical test of the proposed model could indicate whether organizational experiences mediate the relationship between race and job performance evaluations, as Ilgen and Youtz (1986) suggested. In addition, we hoped to determine whether organizational experiences, job performance evaluations, or both mediated the relationships

of race with advancement prospects and career satisfaction. In path analytic terms, this study examined whether the impact of race on performance and career outcomes is indirect—through the mediating variables—or direct. Through the present research, therefore, we sought to contribute to the development of empirically grounded theory concerning the mechanisms by which race affects employees' job performance and career outcomes.

METHODS

Overview of Procedures

Three companies having extensive operations in the eastern United States and representing the communications, banking, and electronics industries agreed to participate in a comprehensive study of managerial career experiences with a special emphasis on the careers of black managers. Following Fernandez (1975), we defined managers as employees designated as managers, officials, and professionals according to the guidelines of the Equal Employment Opportunity Commission. Our goal was to identify as many black managers as possible within each company and then obtain a matched group of white managers comparable in background to the black managers. Within each company, we identified all blacks who held managerial positions through company records. Then, we matched each black manager with a white manager who was as similar as possible in age, length of organizational service, job function, and organizational level. The purpose of the matching procedure was to assure that any observed race differences in organizational experiences, job performance evaluations, and career outcomes could not be attributed to differences in the background characteristics of the black and white managers.

A comprehensive survey was distributed through company mail to each manager selected to participate in the study. Participation was voluntary, and we assured participants that their individual responses would be treated as confidential. The survey was accompanied by a cover letter from a company official strongly encouraging participation in the study and a postage-paid envelope in which respondents were to return their completed surveys directly to us at our university address. In addition, the supervisor of each manager selected received a survey, cover letter, and return envelope. We affixed identical code numbers to the two surveys so that we could link managers' and supervisors' responses.

Respondents

Through the procedure described in the previous section, we chose 1,628 managers—814 blacks and 814 whites—and their supervisors to participate in the study. In response to the initial mailing and one follow-up reminder, we received completed surveys from 996 managers (a 61.2 percent response rate) and 1,273 supervisors (a 78.2 percent response rate). Paired data were available for 828 managers and their respective supervisors (50.8 percent). Of the 828 manager-supervisor pairs 595 (71.8%) were from the

communications firm, 140 (16.9%) were from the banking firm, and 93 (11.2%) were from the electronics company.

Of the 828 managers who responded, 373 (45%) were black and 455 (55%) were white. There was a significant relationship between race and gender ($r = -.13$, $p < .01$): black managers were more likely than white managers to be women. The final group of respondents included 228 black women, 140 black men, 221 white women, and 231 white men (8 respondents did not report gender).

The mean age of the managers was 38.72 years (s.d. = 8.20), and the modal (41.1%) annual salary was $30,000–$39,999. Length of tenure in the current job averaged 3.44 years (s.d. = 3.88), and length of tenure in the organization averaged 15.09 years (s.d. = 7.88). The managers had reported to their current supervisors for an average of 2.24 years (s.d. = 2.28). About 75 percent of the managers had attended college, and 34 percent were college graduates. There was a considerable range in the number of subordinates reporting to the respondents (0–99), suggesting the group contained a balanced mix of managers and professionals in a wide variety of supervisory and nonsupervisory positions.

Preliminary analysis revealed that race was unrelated to age, organizational tenure, job function, or organizational level in any of the three companies, thereby indicating that the matching process was successful in producing demographically similar samples of blacks and whites. It should also be noted that the final group of respondents contained an unequal number of blacks (373) and whites (455). Because the selection procedure was successful in producing comparable groups of black and white managers, there was no need to limit the analysis to the original matched set of black and white managers, which would have substantially reduced the number of respondents in the study.

In summary, the managers in the present study represented diverse job functions within three organizations and a wide range of managerial, professional, and supervisory positions. Their educational and salary levels suggested that most of the managers studied held lower- to middle-level management and professional positions. The diversity of job functions and the high response rates suggest that the respondent group represented the population of black managers in the three companies. Perhaps most important, the black and white managers were comparable in terms of age, organizational tenure, job function, and organizational level.

Measures

Race and gender. Race was entered as a precoded digit (1 = black, 2 = white) that was part of the employee research number located on the cover page of the managers' survey. Gender was assessed with a fixed-response item (coded 1 = man; 2 = woman) included in the background information section of the survey.

Organizational experiences. Sponsorship was measured by two items included in a section of the managers' survey dealing with participation in

training and development activities (see the Appendix for the texts of these items and of other items written for this research). The items briefly described a mentor and a sponsor, focusing on the career-enhancing functions of such relationships rather than their psychosocial aspects (Kram, 1985). For instance, mentors were described as providing advancement opportunities, visibility, and advice to their protégés. Sponsors were said to offer favored status, special treatment, and increased power. Managers were asked to indicate the most recent year in which they had experienced each relationship. Because of the common element of career-enhancing functions inherent in both descriptions and the significant correlation between the two items ($r = .46$, $p < .01$), we created a combined variable called sponsorship. Managers who reported having experienced both a mentoring and a sponsoring relationship were coded 2; those who reported having experienced one of the relationships were coded 1; and those who reported having experienced neither relationship were coded 0.

In order to measure perceived supervisory support (see the Appendix), managers indicated their agreement or disagreement with nine items concerning the degree of career support they received from their immediate supervisor (e.g., "My supervisor takes the time to learn about my career goals and aspirations"). We averaged responses to the nine items to produce a total supervisory support scale ($\alpha = .93$). Perceived job discretion was measured with five items (e.g., "I have considerable decision-making power on my job") taken from a longer "job power" scale developed by Nixon (1985c: 18). We averaged these responses to produce a total job discretion score ($\alpha = .76$).

Perceived organizational acceptance was assessed with eight items (e.g., "I feel isolated from others in my work group," reverse-scored) taken from a longer "corporate fit" scale developed by Nixon (1985b: 20–21). We averaged responses, each made on a 5-point scale ranging from "strongly agree" to "strongly disagree," to produce a total acceptance score ($\alpha = .79$). Career strategies were measured with eight items from Gould and Penley's (1984) Career Strategies Inventory. Managers indicated the frequency with which they had engaged in certain activities within the past year (e.g., "Made your boss aware of the assignments you want") on a 5-point scale ranging from "very frequently" to "never." Responses were averaged to produce a total career strategy score ($\alpha = .67$) in which high scores represented extensive use of career strategy behaviors.

Job performance evaluations. Managers' job performance was evaluated with a 23-item rating scale (Touliatos, Bedeian, Mossholder, & Barkman, 1984) included in the supervisors' survey. Using a 7-point scale ranging from "unsatisfactory" to "excellent," supervisors rated the managers on such characteristics as ability, cooperation, job knowledge, and quality of work. A factor analysis with varimax rotation produced two factors with eigenvalues of one or higher that accounted for 62.9 percent of the total variance. Factor 1, labeled relationship, accounted for 51.4 percent of the common variance, and included the following items, which are shown with their factor load-

ings: commitment to organization, .82; commitment to job, .78; attitude, .78; loyalty to organization, .76; cooperation, .76; loyalty to supervisor, .74; honesty, .64; punctuality, .57; interpersonal relationships, .52; and attendance, .49. These items were all associated with the satisfactoriness of the relationships employees had developed with their organization and its members. We averaged responses to the ten items comprising this factor to create a scale tapping the relationship component of job performance (α = .93).

Factor 2 included ratings of ability (.80), judgment (.74), accuracy (.73), job knowledge (.70), creativity (.69), and promotability (.66). This factor explained 48.6 percent of the common variance and represented a task component of job performance. However, we deleted the item assessing promotability in factor 2 because it overlapped with the promotability assessment variable (see below) and because conceptually, it appeared to be less task-related than the other five items loading on the factor. We averaged responses to the remaining five items to create a scale tapping the task component of job performance (α = .89). We examined the two dimensions of job performance evaluations—relationship and task—separately in all subsequent analyses.

Career outcomes. Managers' advancement prospects were assessed in two ways. Supervisors made a promotability assessment through their response to the following item on the supervisors' survey: "What is the likelihood that the employee will be promoted to a higher position sometime during his or her career with the company?" Responses to this item were made on a 4-point scale ranging from "high likelihood" to "no likelihood."

Managers' advancement prospects were also measured in terms of whether they had reached a plateau in their career. This measure was based on the length of managers' tenures in their current jobs. Following Veiga (1981) and Gould and Penley (1984), we considered managers to be at a career plateau (coded 2) if they had been in their current job seven years or more. Although job tenure does not directly assess whether an individual has reached a plateau, it appears reasonable to assume that a long time in one position indicates limited prospects for upward mobility. In fact, seven years was more than twice the average length of job tenure (3.44 years) observed for the present group of managers. Significant relationships between this variable and (1) supervisory ratings of promotability (r = $-.20$, $p < .01$) and (2) managers' perceptions of their own advancement opportunities (r = $-.25$, $p < .01$) provide further support for our measure of plateau status.

Career satisfaction was measured with five items developed expressly for this study (e.g., "I am satisfied with the progress I have made toward meeting my overall career goals"). We averaged responses to produce a total career satisfaction score (α = .88; see the Appendix).

Data Analyses

Preliminary analyses, conducted to determine whether we could combine respondents from all three companies in examining the causal model, revealed that the managers' demographic characteristics were quite similar

across the companies. In addition, correlationa analyses revealed that the relationships among the variables shown in Figure 1 were substantially similar in all three companies. Thus, we conducted all subsequent analyses on the combined group.

Path analysis was used to determine whether the observed pattern of relationships among the variables was consistent with the causal model presented in Figure 1. Additionally, we took several steps to check for possible violations of the assumptions underlying path analysis (Billings & Wroten, 1978; Heise, 1969). Examination of the alpha coefficients indicated satisfactory levels of internal consistency reliability among the multiitem scales. Moreover, the intercorrelations among the study variables, ranging from $-.20$ to $.67$ (median $r = .08$), revealed no evidence of extreme multicollinearity (i.e., r's $\geq .80$). We also calculated Durbin-Watson d-statistics for each dependent variable in the model to test for autocorrelations among the residuals of the dependent variables. In such a calculation, the closer d is to 2, the stronger the evidence that the residuals are uncorrelated (Dillon & Goldstein, 1984). In the present study, the distribution of the d-statistics ($\bar{x} = 1.97$, range $= 1.87-2.09$) strongly indicated the absence of correlated residuals.

The omitted parameter test (James, Mulaik, & Brett, 1982) was used to determine whether the paths predicted in Figure 1 were statistically significant and whether the unpredicted paths were nonsignificant. This test involves the analysis of all direct paths among the variables in a model, whether predicted or unpredicted, and thereby facilitates identification of specific sources of confirmation and disconfirmation within a proposed model.

Hierarchical multiple regression analyses were performed to conduct the omitted parameter test and to assess the direct and indirect effects of the causal variables on successive dependent variables. Accordingly, we first regressed each career outcome on gender as a control variable, adding race in step two, the five organizational experiences in step three, and the two job performance factors in step four. In a similar manner, we regressed each job performance factor on gender in the first step, adding race and the five organizational experiences in steps two and three respectively. Finally, we regressed each organizational experience on gender in the first step and added race in the second step. The initial beta weight of a variable when it first enters a regression analysis represents the total effect of that variable on the dependent measure, whereas the final beta weight, calculated after all variables have entered the analysis, represents the variable's direct effect. The difference between the total effect and the direct effect reflects the indirect effect of the variable on the dependent measure (Ross, 1975).

RESULTS

Table 1 presents the means, standard deviations, and intercorrelations among the variables examined in this study. The correlations reveal that

TABLE 1
Intercorrelations Among Variables[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Sponsorship	0.48	0.71												
2. Acceptance	4.02	0.64	.14**											
3. Job discretion	3.02	0.88	.14**	.36**										
4. Supervisory support	3.32	1.04	.12**	.42**	.32**									
5. Career strategies	3.04	0.62	.32**	.12**	.22**	.08								
6. Job performance, relationship	5.76	0.88	.05	.25**	.25**	.31**	.05							
7. Job performance, task	5.20	0.93	.03	.15**	.15**	.14**	.04	.65**						
8. Promotability assessment	3.07	0.90	.15**	.14**	.04	.11**	.11**	.37**	.42**					
9. Career plateau[b]	1.17	0.38	-.12**	.02	.07*	-.04	-.07*	-.07*	.03	-.20**				
10. Career satisfaction	3.38	1.02	.15**	.25**	.32**	.37**	.06*	.20**	.09**	.06	-.06*			
11. Race[c]	1.55	0.50	.03	.10**	.06*	.05	-.04	.14**	.23**	.09**	-.06*	.15**		
12. Gender[d]	1.55	0.50	.02	-.08*	-.08	-.04	.02	.03	.02	.04	-.07*	.05	-.13**	

[a] Because of pairwise deletion of missing data, N ranged from 760 to 828.
[b] 1 = not plateaued, 2 = plateaued.
[c] 1 = black, 2 = white.
[d] 1 = man, 2 = woman.
* $p < .05$, one-tailed test.
** $p < .01$, one-tailed test.

black managers reported having less job discretion and lower feelings of acceptance than white managers. In addition, blacks were rated lower on both dimensions of job performance, received lower promotability assessments, were more likely to be at career plateaus, and were more dissatisfied with their careers than whites.

Table 2 presents the results of the hierarchical multiple regression analyses testing the fully recursive model and indicates the total, direct, and indirect effects of the causal variables on the dependent measures. The data provide only limited support for the overall model proposed in Figure 1. Only 11 of the 21 predicted paths are statistically significant, whereas 13 of the 20 unpredicted paths are significant.

The analyses also identified specific sources of confirmation and disconfirmation of the proposed model. For example, the results provide partial support for the hypothesis that blacks will report more negative organizational experiences than whites. As the results shown in Table 2 indicate, race had significant effects on job discretion and acceptance. Blacks perceived themselves as having less discretion in their jobs and reported lower organizational acceptance than did whites. Contrary to the model's predictions, race had no effects on sponsorship, supervisory support, or career strategies.

With regard to the relationships between organizational experiences and job performance evaluations, three of the organizational experiences—job discretion, acceptance, and supervisory support—had positive effects on the relationship dimension of job performance. The model also predicted that race would have an indirect effect on job performance, with organizational experiences mediating the relationship between race and performance. Although Table 2 indicates that race had an indirect effect on the relationship dimension of job performance, it is clear that the direct effect (.13) was substantially stronger than the indirect effect (.03).

A similar pattern of results emerged in the prediction of the task dimension of job performance. The causally prior variables explained 9 percent of the variance in this dependent variable, and two of the organizational experiences, job discretion and support, had significant effects on this dimension of job performance. Although race had both direct effects and indirect effects (through job discretion) on the task dimension of job performance, the direct effect (.22) was considerably stronger than the indirect effect (.01).

With regard to the prediction of career outcomes, the variables in the model explained 22 percent of the variance in promotability assessments, 6 percent of the variance in career plateau status, and 22 percent of the variance in career satisfaction. As Table 2 shows, the results provide moderate support for the hypothesized linkage between job performance evaluations and career outcomes. Performance evaluations had direct effects on promotability assessments and career plateau status but not career satisfaction. Contrary to our predictions, several organizational experiences had direct effects on career outcomes. For example, sponsorship was associated with favorable assessments of promotability, low incidence of career plateauing,

TABLE 2
Direct and Indirect Effects of Antecedent Variables

(a) Organizational Experiences

Antecedent Variables	Sponsorship	Discretion	Acceptance	Supervisory Support	Career Strategies
Gender[a]	.02	-.08*	-.08*	-.05	.02
Race[b]	.04	.07*	.11**	.05	-.02
R^2	.00	.01**	.02**	.00	.00

(b) Job Performance Evaluations

Antecedent Variables	Relationship Dimension			Task Dimension		
	Total	Direct	Indirect	Total	Direct	Indirect
Gender	.03	.07*	-.04	.03	.06	-.03
Race	.16	.13**	.03	.23	.22**	.01
Sponsorship	-.02	-.02	.00	-.02	-.02	.00
Job discretion	.14	.14**	.00	.08	.08*	.00
Acceptance	.09	.09*	.00	.06	.06	.00
Supervisory support	.23	.23**	.00	.08	.08*	.00
Career strategies	.02	.02	.00	.04	.04	.00
R^2	.15**			.09**		

TABLE 2 (continued)

(c) Career Outcomes

Antecedent Variables	Promotability Assessments			Career Plateau[c]			Career Satisfaction		
	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Gender	.03	.00	.03	-.07	-.06*	-.01	.04	.09**	-.05
Race	.10	.00	.10	-.08	-.10**	.02	.18	.14**	.04
Sponsorship	.11	.12**	-.01	-.13	-.13**	.00	.08	.09**	.04
Job discretion	-.05	-.10**	.05	.12	.13**	-.01	.21	.21**	.00
Acceptance	.08	.04	.04	.03	.04	-.01	.05	.05	.00
Supervisory support	.08	.02	.06	-.07	-.04	-.03	.26	.25**	.01
Career strategies	.08	.06*	.06	-.05	-.05	.00	-.06	-.06*	.00
Job performance, relationship	.16	.16**	.00	-.16	-.16**	.00	.06	.06	.00
Job performance, task	.31	.31**	.00	.14	.14**	.00	-.03	-.03	.00
R^2	.22**			.06**			.22**		

[a] 1 = man, 2 = woman.
[b] 1 = black, 2 = white.
[c] 1 = not plateaued, 2 = plateaued.
 * $p < .05$, one-tailed test.
** $p < .01$, one-tailed test.

and high levels of career satisfaction. Job discretion was associated with relatively unfavorable advancement prospects but high levels of career satisfaction. Career strategy behaviors were positively related to assessments of promotability but negatively related to career satisfaction.

The model predicted that race would have indirect effects on the career outcomes specified, with organizational experiences and job performance evaluations mediating the relationships between race and outcomes. Although race was significantly related to each career outcome, the effect varied somewhat across outcomes. In line with the proposed model, the effect of race on promotability assessments (.10) was entirely indirect (see Table 2), operating through job discretion and the two job performance evaluation variables. Failing to fit the model, however, were direct race effects on career plateau status and career satisfaction. As indicated in Table 2, the direct effects of race on plateau status ($-.10$) and on career satisfaction (.14) were substantially stronger than the respective indirect effects (.02 for career plateau status and .04 for career satisfaction).

DISCUSSION

The aim of this study was to examine relationships among race, organizational experiences, job performance evaluations, and career outcomes. In particular, the research sought to determine whether organizational experiences mediated race differences in job performance evaluations and whether organizational experiences and job performance evaluations mediated race differences in career outcomes. The results provided limited support for the mediational processes specified in the model and revealed that race had direct effects on job performance evaluations, career plateauing, and career satisfaction.

Significant race effects were observed for both job performance dimensions: supervisors rated blacks lower than whites on both the relationship and the task components of performance. These results are remarkably consistent with the results of Kraiger and Ford's (1985) meta-analysis. They found that the best estimate of the population effect in field studies with white raters was .192, which indicates that race explained approximately 3.7 percent of the variance in job performance ratings. In the present field study with predominantly (93.3%) white raters, race accounted for 2.5 percent of the variance in the relationship component of performance and 5.5 percent of the variance in the task component. Averaged across components, race explained 4 percent of the variance in job performance evaluations. Thus, bearing out Kraiger and Ford's findings, the effect of race on job performance evaluations in the present study was significant and modest in magnitude.

Ilgen and Youtz (1986) suggested that the differential treatment minority members experience may explain race differences in job performance. The finding that a portion of the race effect on job performance operated indirectly through job discretion and acceptance provides some support for this assertion. Thus, the less favorable job performance evaluations received by

black managers are partially attributable to the lower levels of job discretion blacks experienced and their lower level of organizational acceptance. The race differences in job discretion and acceptance found in this study are consistent with the findings of Fernandez (1975, 1981) and Nixon (1985b). The results of the present study, with its demographically comparable samples of blacks and whites, strengthen the conclusion that blacks may be excluded from opportunities for power and integration within organizations and that such exclusion may be detrimental to their job performance.

However, it should be recalled that the effects of race on job performance evaluations were primarily direct. We can offer several explanations for this direct effect. It is possible that other organizational experiences, unexamined in the present research, were responsible for the race differences in job performance evaluations. This explanation assumes that race's effect on evaluations reflects actual performance differences between blacks and whites and that differential treatment and experiences within the organizations caused these performance differences In a similar vein, it is possible that differential experiences before entering the organizations studied, such as early educational experiences and socialization processes, are responsible for race differences in work effectiveness. Future research should examine a range of organizational and extraorganizational experiences that may impede the performance of black managers.

Alternatively, it is possible that race differences in job performance evaluations do not reflect differences in actual job performance but instead indicate the presence of bias in the rating process. Since race explained more variance than organizational experiences in job performance evaluations, it is possible that the predominantly white supervisors used race rather than work-related cues in assessing the managers' job performance. Some previous studies have indicated the presence of rater bias, the most prominent illustration of which is the tendency of raters to give higher ratings to same-race ratees revealed in Kraiger and Ford (1985). Researchers should examine stereotyping, information selection and use, and judgment processes (Ilgen & Youtz, 1986) as potential sources of bias in future work. Such research should also include objective measures of job performance like sales volume and task goal accomplishment to determine more precisely the presence of bias in job performance evaluations.

Race differences were also observed for each of the career outcomes under investigation. Blacks received less favorable assessments of promotability from their supervisors, were more likely to have plateaued in their careers, and were more dissatisfied with their careers than whites. These findings are consistent with prior research suggesting that black managers experience restricted advancement opportunities and career dissatisfaction (Alderfer et al., 1980; Brown & Ford, 1977; Fernandez, 1981; Jones, 1986).

The effect of race on promotability assessments was entirely indirect, operating primarily through job performance evaluations: black managers were seen as having relatively restricted promotion opportunities because they received lower performance ratings than whites. This finding under-

scores the urgency of understanding sources of race differences in rated job performance, since performance ratings played such a prominent role in supervisors' assessments of managers' promotability.

The effect of race on career plateauing was predominantly direct. Moreover, the impact of race on plateau status is not likely to be an artifact of the sampling procedure used here, since the black and the white managers were similar in age, organizational tenure, job function, and organizational level. In addition, although it has been argued that blacks are assigned to dead-end jobs, the present data do not support that assertion. We measured "career path elasticity" (Veiga, 1981), an assessment of the extent to which the previous incumbent of a particular position has been mobile within an organization. The absence of a significant relationship between race and career path elasticity among the present respondents ($r = -.06$) suggests that other factors are responsible for the long job tenures of the black managers. Future research should examine the extent to which race differences in career plateauing are due to organizational decisions to keep a manager in a specific position as opposed to managers' decisions to remain in their jobs.

Race had a small indirect effect on career satisfaction. One reason blacks reported lower career satisfaction than whites was because the blacks perceived less discretion and autonomy on their jobs than the whites. However, the direct effect of race on career satisfaction overwhelmed the indirect effect. Additional research needs to identify the determinants of career satisfaction so that race differences in career satisfaction can be better understood. Since the career concept is ultimately related to time (Arthur, Hall, & Lawrence, 1989), perhaps time-related variables like the attainment of career goals and promotion history would be potent predictors of career satisfaction and would provide a deeper understanding of race differences in career satisfaction.

Several other findings deserve brief discussion. It is heartening that we found no race differences in sponsorship and supervisory support. This absence is especially noteworthy since support seemed to promote effective job performance and career satisfaction, and sponsorship had direct effects on promotability, career plateau status, and career satisfaction. Further research is needed to determine why minority members may experience disparate treatment in some domains (job discretion, acceptance) and not others (sponsorship, support). In addition, blacks were as likely as whites to participate extensively in career strategy activities. Thus, there was no evidence that black managers engaged in self-limiting behaviors regarding the management of their careers. The possibility of race differences in other manifestations of self-limiting behavior should be examined in future research.

CONCLUSIONS

The results of the present study provided only limited support for the proposed model. It appears that the relationships among the model variables

are more complex than we initially proposed them to be and that a "complete mediational model" (James & Brett, 1984: 308) may represent an oversimplification of the mechanisms that explain race differences in job performance evaluations and career outcomes. Thus, the model should be revised to incorporate additional organizational experiences, such as receiving challenging task assignments with high visibility, as well as extraorganizational variables like educational experiences and personal characteristics that may be relevant to understanding the job performance and career outcomes of members of different subgroups. Such a revised model should also examine both the full and partial mediational processes that may be operating and explore the possibility of bias in the performance rating process. We hope the results of the present study will encourage scholars to conduct programmatic research to further examine the network of variables that impinge on the job performance evaluations and career success of both black and white managers.

Such research should be conducted in a broad range of work organizations. Most of the data in the present study came from one large communications company. Although correlational analyses suggested that the findings were similar across all three companies studied, it is still possible that characteristics of the largest company molded the present results. Therefore, the generalizability of the findings to other companies and industries needs to be established. Moreover, blacks and whites representing a broad range of managerial levels should be represented in future studies. Members of the present sample occupied predominantly lower- and middle-level managerial and professional positions. Thus, the generalizability of these findings to upper-level executives and professionals awaits confirmation through additional research.

Although the race effects in the present study were modest in magnitude, the consistent direction of these differences should caution employers to be vigilant in their attempts to assure equal opportunity. The observed race differences in perceived job autonomy and acceptance suggest that supervisors should be sensitive to the potential for disparate treatment of minority subordinates and should examine their own behavior for possible bias. The present results also suggest that organizations should periodically examine managers' job performance evaluations, advancement experiences, and career attitudes for possible differences based on race. The presence of race differences in any of these variables should be carefully scrutinized to identify their underlying causes and to determine whether these differences reflect unfair treatment. The importance of establishing an unbiased performance rating system cannot be overemphasized, given the dominant role of ratings in shaping future advancement opportunities.

A work environment conducive to equal employment opportunity should produce minimal race differences in work-related experiences and outcomes. Considerable research is necessary to identify the potential for race differences in these variables and to understand the determinants and

consequences of those differences that do exist. The current study represents a first step in that direction and constitutes a significant building block toward the development of theory concerning the role of race in career dynamics.

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APPENDIX
Previously Unpublished Measures Used in This Study

Sponsorship

Managers were provided with the following definition of a mentoring relationship: "A relationship with a more experienced colleague in order to provide you with increased opportunities for advancement, corporate visibility, guidance and advice, and 'running interference.' " A sponsoring relationship was defined as "A relationship with an individual of higher status or greater influence in the organization that provides you with 'favored status,' special treatment, or increased power and influence."

Supervisory Support

Managers indicated the extent to which they agreed or disagreed with each of the following statements, responding on a 5-point scale where 5 = strongly disagree, 4 = disagree to some extent, 3 = uncertain, 2 = agree to some extent, and 1 = strongly agree. Responses were reverse-coded so that high scores reflected extensive perceived career support.

1. My supervisor takes the time to learn about my career goals and aspirations.
2. My supervisor cares about whether or not I achieve my career goals.
3. My supervisor keeps me informed about different career opportunities for me in the organization.
4. My supervisor makes sure I get the credit when I accomplish something substantial on the job.
5. My supervisor gives me helpful feedback about my performance.
6. My supervisor gives me helpful advice about improving my performance when I need it.

7. My supervisor supports my attempts to acquire additional training or education to further my career.
8. My supervisor provides assignments that give me the opportunity to develop and strengthen new skills.
9. My supervisor assigns me special projects that increase my visibility in the organization.

Career Satisfaction

Managers indicated the extent to which they agreed or disagreed with each of the following statements, using the same 5-point, reverse-coded scale as for the supervisory support items.

1. I am satisfied with the success I have achieved in my career.
2. I am satisfied with the progress I have made toward meeting my overall career goals.
3. I am satisfied with the progress I have made toward meeting my goals for income.
4. I am satisfied with the progress I have made toward meeting my goals for advancement.
5. I am satisfied with the progress I have made toward meeting my goals for the development of new skills.

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IMPACT OF PROCESS AND OUTCOME FEEDBACK ON THE RELATION OF GOAL SETTING TO TASK PERFORMANCE

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Previous studies have demonstrated the interactive effects of goal set-
ting and feedback. The present study examined process and outcome
feedback as moderators of the relation of goal setting to performance,
task-strategy quality, appropriateness of information search, effort, and
self-confidence. Using a stock-investment computer simulation, 85 stu-
dents worked under experimental conditions in which goals and pro-
cess and outcome feedback were varied in a completely crossed facto-
rial design. Results support the hypothesis that both process and out-
come feedback interact with goal setting to enhance performance. In
addition, the interaction of goal setting and process feedback was more
strongly related to the quality of information search and task strategy
than the interaction of goal setting and outcome feedback; the latter was
more strongly related to self-confidence and effort than was the inter-
action between goal setting and process feedback. We discuss the re-
sults in terms of expanding the role of studying feedback in research on
goal setting.

Feedback and goal setting have become integral management tools be-
cause they are thought to serve both informational and motivational func-
tions that enhance an individual's work performance (Kopelman, 1986;
Locke, Cartledge, & Koeppel, 1968). Feedback can provide information about
the correctness, accuracy, and adequacy of work behaviors. Motivationally,
feedback may be necessary for instilling a sense of competence, accomplish-
ment, and control in workers (Bandura, 1977; Hackman & Oldham, 1976).
Likewise, the beneficial effect of specific and challenging goals on an indi-
vidual's task performance is a well-documented phenomenon (Locke, Shaw,

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Saari, & Latham, 1981; Mento, Steel, & Karren, 1987; Tubbs, 1986). Goals are thought to enhance performance through increasing effort and persistence, directing attention, and improving strategy formulation (Locke et al., 1981).

Research has suggested that goal setting and feedback have an interactive relation; with feedback being a necessary but not sufficient condition for effective goal setting (Erez, 1977; Kim, 1984; Locke & Latham, 1990). Feedback typically consists of information provided to individuals concerning the outcomes of their performance—the number of widgets they have completed, for example. Many issues concerning feedback's relevance to goal-setting effects remain unexplored. For instance, researchers have focused almost exclusively on outcome feedback (e.g., Ilgen & Moore, 1982) even though a variety of other forms of feedback exist. The typical research manipulation focusing on the presence or absence of feedback is problematic since feedback's presence does not ensure its specificity; the key to the interaction between feedback and goal setting is the clarity of the feedback, not its mere presence. Additionally, the relation of the goal-feedback interaction to the variables theorized to intervene in the relation between goal setting and performance (cf. Locke et al., 1981) remains unclear. Our study addressed several of these questions by varying two forms of feedback according to level of specificity. The two forms were *outcome feedback*, or information concerning performance outcomes and *process feedback*, or information concerning the manner in which an individual implements a work strategy. In addition, we examined the relative effects of the interactive relations with regard to several variables—self-confidence, effort, and task strategy implemented—thought to intervene in goal setting's relation to task performance.

Support for the interactive effects of goal setting and feedback comes from a variety of sources (e.g., Becker, 1978; Strang, Lawrence, & Fowler, 1978). Erez (1977) presented the first statistical demonstration of the moderating effect of feedback on the relation of goal setting to performance, finding that goal setting significantly improved performance only for individuals who had received feedback. Additional support for the importance of feedback to goal-setting effects comes from Frost and Mahoney (1976), who observed that subjects having a difficult or a moderately difficult goal performed much better if they received feedback than if they did not. However, Ilgen and Moore (1982) failed to demonstrate an interaction of feedback and goal setting, a failure that may be attributable to their method of analysis (Bobko [1986] contains a further discussion).

Two mechanisms explain the importance of feedback to goal setting. First, several studies have demonstrated the interactive consequences of goal setting and outcome feedback for self-reactive variables like an individual's performance expectancies (Matsui, Okada, & Inoshita, 1983), self-confidence and esteem (Kopelman, 1986), and self-efficacy expectations (Bandura & Cervone, 1983, 1986; Earley, 1988). Bandura and Cervone found that people used discrepancies between goals and outcome feedback as the basis for

such cognitive self-evaluations as judgments about self-efficacy and satis-
faction. These self-evaluations, in turn, influenced an individual's effort
and, thereby, performance. Thus, the self-reactive impact of feedback seems
to depend on an evaluation of performance outcomes relative to a goal. This
self-assessment provides people with a basis for adjusting levels of effort.

The second mechanism through which the interactive effects of goal
setting and feedback influence performance—the effect of information on
the search for and formulation of a task strategy—has received scant atten-
tion. In their review of the literature on feedback, Ilgen, Fisher, and Taylor
(1979) described a directional role for feedback in addition to its evaluative
one (cf. Annett, 1969; Locke et al., 1968). The self-evaluative and directional
roles of feedback are analogous to the magnitude and direction of a force
vector in physics. Feedback allows individuals to compare their behavior
with predefined targets (goals) and to determine whether or not to adjust
their actions or their targets (Campion & Lord, 1982; Carver & Scheier, 1983).
Lacking clear feedback and a specific goal, an individual will be unable to
judge when to alter a chosen course of action (direction) or how much effort
to expend (magnitude). Indirect support for this distinction comes from Kim
(1984), who compared behavior-specific goals, defined by the activities peo-
ple engaged in, and outcome-specific goals, defined in terms of sales per-
formance. He found that individuals with the highest sales had both types of
goals and feedback. Likewise, Annett (1969) distinguished between feedback
concerning the outcomes of actions and the actions themselves.

Although outcome feedback can identify the need to adjust action, it
often does not provide specific information concerning how to adjust—
information on the direction of behavior. Such adjustment information be-
comes particularly important for performing complex or unstructured tasks
in which the relation of behaviors to performance outcomes may be uncer-
tain (Campbell, 1988). As a result, an individual who receives outcome
feedback while performing an unstructured or complex task may make in-
appropriate adjustments. The directive, strategy-shaping effect of feedback
can occur much more directly and accurately when feedback focuses on the
behavioral processes that generate outcomes. Such feedback concerns the
process of performing a task, as opposed to the outcomes of the performance
or an individual's task strategy. The research of Tharp and Gallimore (1976),
who studied the verbal behavior of John Wooden, the highly successful
basketball coach at the University of California, Los Angeles, provided a
concrete example of process feedback. Tharp and Gallimore found that at
least 65 percent of Wooden's comments during practice games consisted of
specific statements to his players about what they were doing and how to
perform better in the future. Process feedback facilitates people's perfor-
mance by helping them develop an effective task strategy.

In practice, feedback contains both outcome and process components.
For instance, a player whose outcome is losing a set of tennis undoubtedly
realizes that some change in strategy (process) is necessary. However, spe-

cific process feedback like "You're hitting all your shots to your opponent's forehand" provides substantially more informative cues for strategic adjustments than the mere fact of loss. What differentiates feedback statements is their specificity about outcomes or processes and thereby the extent to which they fill both motivational and directional roles through affecting both effort and strategy development. For well-learned and well-structured tasks, specific outcome feedback alone may be sufficient to stimulate performance improvements. When a task is not well-learned or well-structured, however, managers who take the step of providing specific process feedback should facilitate their subordinates' search for successful task strategies.

This study separately examined the roles of these two aspects of feedback on performance, outcome and process, in producing the interactive effects of goal setting and feedback. We conducted a laboratory experiment in which goal setting was analyzed in relation to both process and outcome feedback. It is important to remember that in practice all feedback contains both process and outcome components. In this study, we varied the specificity of information contained in feedback messages—and therefore each type of feedback's potential utility—on both process and outcome dimensions. Figure 1 represents the hypothesized interactions between goal setting and each type of feedback.

> *Hypothesis 1a: Performance will be significantly higher when challenging goals and outcome feedback are specific than when either or both are general.*

> *Hypothesis 1b: Performance will be significantly higher when challenging goals and process feedback are specific than when either or both are general.*

> *Hypothesis 2a: Self-confidence and task effort will be significantly higher when challenging goals and outcome feedback are both specific than when either or both are general.*
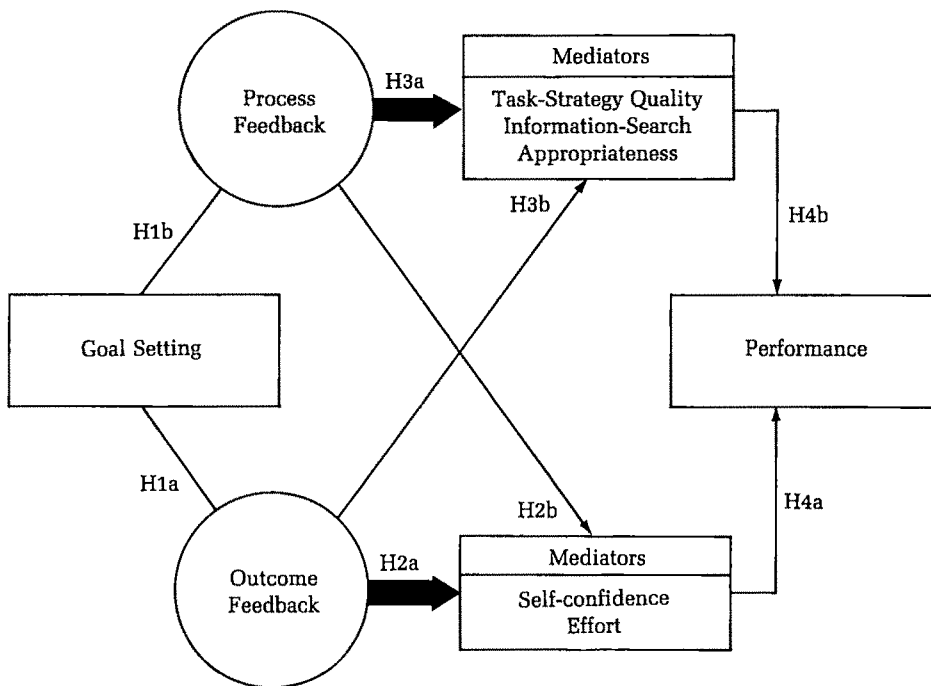
> *Hypothesis 2b: Self-confidence and task effort will not be significantly higher when challenging goals and process feedback are both specific than when either or both are general.*

> *Hypothesis 3a: Task strategies implemented will be significantly better when challenging goals and process feedback are both specific than when either or both are general.*

> *Hypothesis 3b: Task strategies implemented will not be significantly better when challenging goals and outcome feedback are both specific than when either or both are general.*

Thus, the presence or absence of specific outcome feedback should deter-

FIGURE 1

Hypothesized Moderating Effects of Process and Outcome Feedback on the Relation of Goal Setting to Performance

mine the effects of goal setting on self-confidence and effort, and the presence or absence of specific process feedback should determine goal setting's effects on the strategy an individual implements.

To investigate our hypothesized intervening mechanisms, we also examined the mediating roles of self-confidence, effort, and task strategies in the relations of the two interactions to performance. Previous research has identified these mediating effects as the agents through which goal setting influences performance (Earley, Wojnaroski, & Prest, 1987; Locke et al., 1981). Locke and colleagues suggested that goals influence performance by stimulating effort and persistence, directing attention, and stimulating strategy development. Earley and colleagues collapsed these effects into two categories called energy expended and task strategy and found they had a partial mediating effect on the relation of goal setting to performance. In our study, we examined the roles of self-confidence, effort, and task strategies as mediators in the relation between goal setting and performance since they are the key effects of process and outcome feedback that have been hypothesized to allow goal setting to facilitate performance (Earley et al., 1987; Locke et al., 1981).

> *Hypothesis 4a: Self-confidence and effort will mediate the relation of performance to the interaction between goal setting and outcome feedback.*

> *Hypothesis 4b: Task strategy will mediate the relation of performance to the interaction between goal setting and process feedback.*

METHODS

Subjects

Undergraduate students from a southwestern university—49 men and 36 women—were the study's subjects. They were business majors who were recruited from a class in organizational behavior, and they participated in the study in partial fulfillment of a course requirement.

Design and Experimental Task

The task was a stock-market simulation exercise in which people buy and sell blocks of stock for five hypothetical companies (Northcraft & Earley, 1989). Each subject began the simulation with $100,000 in cash and used this cash to trade five stocks during six trading periods. For all experimental conditions, each of the five stocks was at $100 in the beginning and went up or down $10 in price during each round. Five "brokerage houses" provided trading recommendations, with each issuing a trading recommendation to buy or sell for each stock at the beginning of each round. The recommendations of two brokerage houses revealed reliably the movement of a stock across the six rounds; one house was consistently correct, a second was consistently incorrect, and the others were correct 50 percent of the time for each stock. Thus, a key to successful investments was to discover which brokerage houses consistently predicted which stocks correctly.

The experiment had a two-by-two-by-two factorial design crossing goal setting, outcome feedback, and process feedback. There were two levels of goal setting: general, and specific and challenging. Subjects with the general goal were told to "do your best," and those with the specific goal were urged to attain a $10,000 profit by the end of the six rounds of the simulation. Previous research using this same task without explicit goal setting (Northcraft & Earley, 1989) found that about 5 percent of subjects attained the specific, challenging goal.

Outcome and process feedback were available to the subjects during the simulation via a computer program. The program provided a data base that tracked the accuracy of brokerage house predictions (1) summed across stocks, (2) summed across brokerage houses, (3) by brokerage house for each stock, and (4) by stock for each brokerage house. All subjects could query the data base up to three times during each round. The program also summarized an individual's portfolio value whenever asked to, and all subjects saw this summary at least once during each round.

Outcome feedback, which concerned each subject's stock transactions

and their effect on the total cash-equivalent value of the subject's portfolio, was also either general or specific. In the specific outcome condition, subjects received a total numeric portfolio value and a breakdown of shares of stock held as well as cash available; in the general outcome condition, they received only a general statement telling them if they had made or lost money on the previous round and if they had stock or cash left, but not how much.

Process feedback concerned choices of information from the brokerage house predictions data base. When an individual queried the data base, every feedback message included both outcome feedback, either general or specific, and comments, which were highlighted, set apart at the bottom of the screen, and labeled "comment." Eighteen data base selections were available. Ten data base selections (number of correct recommendations a brokerage house had made for each of the stocks [5 selections]; number of correct recommendations for a stock by each of the brokerage houses [5 selections]) were useful for making investment decisions. The remaining eight queries—the number of correct recommendations made by each brokerage house summed across all stocks, the number of correct recommendations for each stock summed across all brokerage houses, the price history for a particular stock (5 selections), and price history summed across all five stocks—were useless for making good investment decisions.

The process feedback manipulation took two forms: evaluative comments concerning the usefulness of information sought from the data base and a record of data base selections and purchases and sales. Process feedback was either general or specific. In the general process feedback condition, the subjects received general comments as they selected queries on the stock and brokerage house screen. For instance, if an individual chose to examine a brokerage house's total correct predictions for a given stock, the comment read, "This information is not useful." In the specific process condition, subjects received specific, evaluative comments; asking for a brokerage house's total correct predictions for a given stock elicited the comment, "Correct picks for each stock is not useful feedback for this task if summed across brokerage houses." Thus, a major difference between the general and specific process feedback offered concerned the specificity of the comments. In addition to the comments, subjects in the specific process feedback condition received records detailing their prior data base inquiries and the shares of each stock they had bought or sold in earlier trials. The subjects in the general process condition were simply told if they had purchased or sold stock on a previous round and used the data base.

Dependent Measures

The cash-equivalent value of each subject's portfolio at the end of the sixth trial represented individual task performance. All subjects began the simulation with $100,000. We assessed task-strategy development using two methods. First, we examined how an individual used the data base, specifically looking at the type of information sought. Second, we formed a com-

posite measure of the quality of an individual's task strategy based on the correctness of purchase and sale decisions.

The appropriateness of an individual's search for information was indexed by the types of queries made, with queries categorized as useful or not useful. If the ratio of useful queries to total queries approached 1.0, an individual had requested only useful information from the data base.

Another measure was developed to assess the quality of an individual's investment strategy. We computed a strategy-quality index using a simple rating procedure (cf. Northcraft & Earley, 1989) For each of the five stocks available, a correct decision to buy or sell received two points; a decision not to buy or sell received one point; and an incorrect choice received no points. If no transactions occurred, a subject received a score of five points. Scores higher than five indicated a profit-making strategy, and those lower than five, a profit-losing strategy. The quality index differs from the performance measure in that an individual's profit or loss depended on the combination of correct investments and the number of shares traded, but the quality index only reflected the extent to which an individual made appropriate purchase and sale decisions. The correlation of performance with task-strategy quality was .51 ($p < .05$).

Effort was measured using the response to a single item: "What methods or strategies would you use to achieve the goal you are trying for next period?" Three options then appeared: "Work harder," "Focus on obtaining a higher profit next period," and "Change the way you approach making investments." For each option, subjects chose among 0, "definitely no"; 1, "not sure"; and 2, "definitely yes." The second and third options did not address hypothesized effects, so we excluded those data from the analyses. Using responses on the first option, we measured effort prior to rounds two, four, and six and averaged the three responses to form a composite score ($\alpha = .79$).

An individual's self-confidence about the task was assessed using responses to two items. The first, "How confident are you that you will obtain the investment profit that you are trying for next period?" was administered at the beginning of the last round. The second, "How confident were you that you would make a profit in your transactions?" was administered after the end of the last round, before any performance feedback was given. For both items, 1 represented "not at all confident" and 5, "extremely confident" ($r = .86$, $p < .05$).

Procedures

After signing up for the experiment, a subject was assigned randomly to a time slot and given instructions for getting to the research site. We had randomly assigned each of the eight experimental conditions to a time slot. Upon arrival at the site, each person was placed in a small (8' × 7') room with a table and a chair and told that the study involved decisions concerning the purchase and sale of stock. Each room was equipped with a desktop NCR personal computer. Next, an experimenter gave the subject a short

verbal overview of the simulation and written instructions on the simulation and operating the computer.

The personal computer was equipped with a user-friendly menu-driven portfolio analysis program (PAP). PAP compiled information on portfolio transactions entered by subjects and contained the brokerage house data base that they could query for feedback. The various program options available to all subjects were (1) new stock prices for a round of the simulation, (2) new brokerage house recommendations, (3) current portfolio contents (stock and cash held and total value), and (4) the data base containing information on the brokerage houses' prediction accuracy and the stocks' histories. Every individual was allowed to select up to 3 feedback messages from the 18 available data base selections during each round of the simulation. A final option on the program was used for buying and selling stocks. After subjects had familiarized themselves with the program, the experimenter answered any questions.

The experimenter enacted the goal-setting manipulation by instructing—orally and in writing—a subject either to "do your best" or to meet the specific, challenging goal of a $10,000 profit. The outcome and process feedback manipulations were enacted via the computer messages.

A round of the simulation ended when a subject entered buy or sell decisions. Before rounds two, four, and six, the subjects responded to the effort and self-confidence items. After six rounds of the simulation, the experimenter entered the room with a short questionnaire assessing several manipulation checks, self-confidence, and self-rated effort. After completing the questionnaire, subjects were debriefed and thanked for their participation.

RESULTS

Manipulation Checks

We assessed the goal-setting manipulation using the responses to four items: "How difficult was your goal for performance in the study?" (1 = not at all difficult, 5 = extremely difficult), "How challenging was the goal you were assigned for making profits?" (1 = not at all challenging, 5 = extremely challenging), "How specific was your goal for performance in the study?" (1 = not at all specific, 5 = extremely specific), and "What, if any, profit goal did you have concerning your performance on the investment task?" (open-ended, 0 = a nonnumeric response, 1 = a numeric response). To assess goal difficulty, we averaged responses to the first two items and analyzed them using a three-way analysis of variance that demonstrated that difficulty had the expected significant main effect on goal-setting condition ($F_{1,79} = 19.82$, $p < .01$). The Pearson correlation of these items was .87 ($p < .01$). To assess goal specificity, we did the same with responses to the third and fourth items and again obtained the expected significant main effect ($F_{1,79} = 47.71$, $p < .01$). The biserial correlation of these items was .80 ($p < .01$).

The introduction to the postexperimental questionnaire distinguished

between two types of feedback: investment results, and comments and data base activity. Investment results were the basis for the outcome manipulation, and the information on activity was the basis for the process manipulation. To assess the outcome feedback manipulation, we averaged and analyzed the responses to two items using a three-way ANOVA. The items were "How specific was the information you received concerning your investment results?" (1 = not at all specific, 5 = extremely specific) and "How detailed was the information you received concerning the investment results?" (1 = very detailed [e.g., exact dollar amounts], 5 = very vague [e.g., general trends only]). The results demonstrated the expected significant effect for the specificity of outcome feedback ($F_{1,78}$ = 391.26, $p < .01$). No other effects emerged, and the correlation between the two items was .91 ($p < .05$).

The process feedback manipulation was assessed using the responses to two items comparable to those used for the outcome feedback check, with "comments" substituted for "investment results." The results of a three-way ANOVA conducted on the averaged ratings of the two items demonstrated the expected significant effect for the specificity of process feedback ($F_{1,78}$ = 147.26, $p < .01$). No other effects emerged, and the correlation between the two items was .88 ($p < .05$).

Two additional checks of the data were made. First, we examined the frequency of data base searches on each round of the simulation across the experimental conditions. The results demonstrated no significant differences in frequency across conditions, but the overall level of search decreased in later rounds of the simulation. For the first four rounds, the modal number of queries was three, and it was two for the remaining rounds. Second, an individual's goal acceptance was assessed using the responses to two items: "I am strongly committed to pursuing the profit goal I was assigned" and "Quite frankly, I don't care if I achieve this profit goal or not" (1 = strongly disagree, 5 = strongly agree; the second item was reverse-scored). We again averaged the responses to these items and analyzed them using a three-way ANOVA. The results demonstrated no significant differences among the experimental conditions, and the grand mean level of acceptance was 4.13. The correlation between the two items was .86 ($p < .05$).

Overview of Analyses

Prior to testing the hypotheses, we conducted a repeated-measures MANOVA with investment period as the repeated factor. A preliminary analysis revealed both a significant main effect for investment period and significant interactions between investment period and each main effect (e.g., goal setting × investment period). Inspection of the cell means revealed that goal setting and both outcome and process feedback had more pronounced effects on performance after the first few rounds of the simulation. We obtained no other interaction effects involving investment period.

Table 1 reports the means, standard deviations, and intercorrelations for performance (expressed in units of $10,000), task-strategy quality, informa-

TABLE 1
Means, Standard Deviations, and Correlations for All Variables Across the Experimental Conditions[a]

	Goals								Intercorrelations[d]				
	General				Specific, Challenging								
	General Process Feedback		Specific Process Feedback		General Process Feedback		Specific Process Feedback						
	Outcome Feedback		Outcome Feedback		Outcome Feedback		Outcome Feedback						
Variables	General	Specific	General	Specific	General	Specific	General	Specific	1	2	3	4	5
1. Performance[b]	9.63 (0.25)	9.58 (0.24)	9.55 (0.36)	9.74 (0.26)	9.56 (0.49)	9.95 (0.54)	9.84 (0.26)	10.12 (0.22)					
2. Task-strategy quality[c]	4.00 (0.70)	4.35 (0.92)	3.93 (0.48)	4.31 (0.71)	4.04 (0.82)	4.94 (0.71)	5.18 (0.82)	5.63 (0.65)	.51				
3. Information-search appropriateness	0.40 (0.27)	0.43 (0.25)	0.38 (0.26)	0.36 (0.26)	0.36 (0.29)	0.72 (0.19)	0.72 (0.10)	0.83 (0.18)	.40	.47			
4. Self-rated effort	1.27 (0.60)	1.44 (0.41)	1.38 (0.69)	1.33 (0.57)	1.30 (0.92)	1.62 (0.63)	1.57 (0.33)	1.75 (0.32)	.19	.32	.02		
5. Self-confidence	1.70 (1.06)	2.90 (1.10)	2.50 (0.97)	2.40 (1.17)	3.00 (1.12)	3.00 (1.18)	2.31 (1.43)	3.46 (1.45)	.06	.05	.07	.14	
N	10	10	10	10	9	10	13	13					

[a] Standard deviations are in parentheses. For performance, task-strategy quality, and information search, we present means across the six rounds of the simulation; effort is the mean for measures taken at rounds two, four, and six.

[b] Performance was measured as profits expressed in units of 10,000; all subjects began with 10.00 units at the beginning of the first round.

[c] Values less than 5.0 indicate a losing strategy, those equal to 5.0, a break-even strategy, and those greater than 5.0, a winning strategy.

[d] Correlations greater than .29 are significant at p < .05.

TABLE 2
Results of Multivariate, Repeated-Measures Analysis of Variance and A Priori Contrasts[a]

Dependent Variables	Independent Variables	df	Means	F	η^2
Performance	Goal setting	1	579.26	9.50**	.11
	Process feedback	1	142.23	2.33	.02
	Outcome feedback	1	386.46	6.34**	.06
	Hypothesis 1a				
	Contrast 1	2	2.17	0.25	.00
	Contrast 2	1	165.19	21.19**	.19
	Hypothesis 1b				
	Contrast 1	2	3.30	0.34	.00
	Contrast 2	1	118.18	14.13**	.15
Self-rated effort	Goal setting	1	3.81	3.74*	.04
	Process feedback	1	0.65	0.64	.00
	Outcome feedback	1	0.14	0.14	.00
	Hypothesis 2a				
	Contrast 1	2	0.10	0.28	.00
	Contrast 2	1	1.41	3.85*	.04
	Hypothesis 2b				
	Contrast 1	2	0.06	0.15	.00
	Contrast 2	1	1.24	2.20	.01
Self-confidence	Goal setting	1	2.09	1.41	.01
	Process feedback	1	1.05	0.71	.00
	Outcome feedback	1	14.76	9.93**	.12
	Hypothesis 2a				
	Contrast 1	2	0.10	0.28	.00
	Contrast 2	1	1.41	3.85*	.04
	Hypothesis 2b				
	Contrast 1	2	0.06	0.15	.00
	Contrast 2	1	1.24	3.20	.02
Task-strategy quality	Goal setting	1	81.16	33.45**	.25
	Process feedback	1	23.42	9.65**	.11
	Outcome feedback	1	34.38	14.17**	.15
	Hypothesis 3a				
	Contrast 1	2	2.62	5.11**	.06
	Contrast 2	1	16.61	9.71**	.08
	Hypothesis 3b				
	Contrast 1	2	0.61	1.15	.01
	Contrast 2	1	24.45	51.45**	.37
Information search	Goal setting	1	8.30	27.50**	.22
	Process feedback	1	1.05	3.69*	.04
	Outcome feedback	1	1.80	5.95**	.06
	Hypothesis 3a				
	Contrast 1	2	1.62	2.80	.02
	Contrast 2	1	6.19	12.69**	.08
	Hypothesis 3b				
	Contrast 1	2	0.97	1.54	.02
	Contrast 2	1	14.44	33.77**	.23

[a] Contrast one involved the general goal and general outcome or process feedback versus the general goal and specific outcome or process feedback versus the specific, challenging goal and general outcome or process feedback. Contrast two involved the specific, challenging goal and specific outcome or process feedback versus the other three conditions.

* $p < .05$; ** $p < .01$

tion-search appropriateness, self-confidence, and self-rated effort. Table 2 reports the results of the multivariate analyses and demonstrates significant main effects for goal setting, process, and outcome feedback. We also conducted separate tests of the hypotheses using a priori contrasts, a procedure Bobko (1986) suggested. These contrasts are used to test a two-way interaction in which each factor has two levels that satisfy two constraints: three cell means do not significantly differ from each other ($\mu_{11} = \mu_{12} = \mu_{21}$) and one cell mean is different from the other three ($\mu_{22} \neq \mu_{11}, \mu_{12}, \mu_{21}$). It is important to note that theory dictates this interaction a priori. For instance, to test Hypothesis 1a, the first contrast compares the mean performance of subjects receiving the general goal and general outcome feedback, the specific goal and general outcome feedback, and the general goal and specific outcome feedback. The second contrast compares these three conditions grouped against the condition in which subjects had the specific goal and specific outcome feedback. According to Bobko, if the first contrast is not significant and the second is, the hypothesized moderating effect is supported. In addition, we examined the relative effect sizes of the interactions of goal setting and outcome and process feedback on the hypothesized intervening variables (task-strategy formulation, self-confidence, and effort). Our model (Figure 1) suggests that goal setting's interaction with outcome feedback influences effort and self-confidence (Hypothesis 2a) more than does goal setting's interaction with process feedback (Hypothesis 2b). Likewise, goal setting × process (Hypothesis 3a) should have a greater effect on task-strategy quality and information search than goal setting × outcome (Hypothesis 3b). We used multiple regression analysis to assess the relative sizes of the effects on the intervening variables of the goal-setting-by-feedback interactions, dummy-coding the experimental conditions in which subjects had the specific, challenging goal and specific outcome or process feedback as 1 and the other three conditions as 0.

Tests of Hypotheses

The first set of hypotheses (1a and 1b) stated that goal setting would increase an individual's performance if accompanied by either specific process or specific outcome feedback. The results of these contrasts, reported in Table 2, demonstrate support for the hypotheses. The performance of individuals who had the specific, challenging goal and specific outcome feedback was significantly higher than the performance of those receiving the other three variations of goal setting and outcome feedback. The performance of subjects with the specific goal and specific process feedback was also significantly higher than the performance of those working under the other three variations of goal setting and process feedback.

The second set of hypotheses suggested that individuals receiving a specific, challenging goal and specific outcome feedback would have higher self-confidence and exert more task effort than individuals in the other outcome feedback conditions. The results of the a priori contrasts demonstrated

support for Hypotheses 2a and 2b.[1] Individuals with the specific goal and specific outcome feedback had higher self-rated effort and self-confidence than individuals in the other conditions. No such differences were significant for the interaction of goal setting and process feedback. The regression analysis demonstrated that the interaction of goal setting and outcome feedback was more strongly related to effort and self-confidence than goal setting by process feedback: for effort, $t_{78} = 5.30$, $p < .01$; b's $= .23$ and $.10$ respectively for the outcome and process interactions; for self-confidence, $t_{78} = 7.36$, $p < .01$; b's $= .28$ and $.00$ for the two interactions.

The third set of hypotheses suggested that individuals receiving specific process feedback and a specific, challenging goal would use better task strategies than individuals receiving the other variations of goal setting and process feedback. The results of the a priori contrasts demonstrated partial support for Hypotheses 3a and 3b. These subjects sought more useful information from the data base and implemented better investment strategies than the other subjects. Consistent with our hypotheses, the regression analysis demonstrated that the interaction between goal setting and process feedback was more strongly related to the quality of task strategy and information search than was goal setting by outcome feedback: for task-strategy quality, $t_{78} = 16.60$, $p < .01$; b's $= .22$ and $.60$ for the goal-setting-by-outcome-feedback and goal-setting-by-process-feedback interactions, respectively; for information search, $t_{78} = 9.49$, $p < 01$; b's $= .21$ and $.48$ for the two interactions. Contrary to our prediction in Hypothesis 3b, individuals who received both a specific, challenging goal and specific outcome feedback sought more useful data base information and implemented better investment strategies than the other subjects. Also, the grouped goal-setting-by-outcome feedback conditions (contrast one) significantly differed for task-strategy quality. An examination of the means suggests that the performance of subjects receiving the general goal and general outcome feedback was lower than that of both subjects who received the general goal and specific outcome feedback and those receiving the specific goal and general outcome feedback.

Finally, we tested the fourth pair of hypotheses using mediated regression analysis (see Table 3) on performance, entering the predictors as follows: for Hypothesis 4a, effort and self-confidence first, then goal setting by outcome feedback; for Hypothesis 4b, task-strategy quality and information search first, then goal setting by process feedback. In line with the results of our earlier analyses, we coded the interaction terms according to the second a priori contrast (see "Overview of Analyses"). Results provide mixed support for Hypothesis 4a. Prior to the entry of controls for effort and self-confidence, the interaction between goal setting and outcome feedback accounted for 15 percent of the variance in performance, whereas it only ac-

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[1] The omnibus interaction tests for self-rated effort and self-confidence were not significant at $p < .05$. However, Bobko (1986) criticized the omnibus test for a hypothesized interaction as unnecessarily conservative when theory indicates an a priori contrast.

TABLE 3
Results of Mediated Regression Analyses

Variables Entered	Step	R^2	ΔR^2	Standard Errors	b
Hypothesis 4a					
Effort	1	.20	.20	.58	1.16
Self-confidence				.26	−0.05
Goal by outcome feedback	2	.27	.07	.84	1.46
Goal by outcome feedback	1	.15	.15	.84	1.46
Effort	2	.27	.12	.58	1.16
Self-confidence				.26	−0.05
Hypothesis 4b					
Information-search appropriateness	1	.36	.36	.38	0.51
Task-strategy quality				.35	1.91
Goal by process feedback	2	.36	.00	.80	−0.19
Goal by process feedback	1	.14	.14	.80	−0.19
Information-search appropriateness	2	.36	.22	.38	0.51
Task-strategy quality				.35	1.91

counted for 7 percent afterwards. Although this decrement in R^2 is significant ($t_{82} = 2.19$, $p < .05$), the interaction still independently accounted for a significant proportion of the variance in performance. Hypothesis 4b was fully supported. Prior to the entry of controls for task-strategy quality and information search, the interaction of goal setting and process feedback accounted for 14 percent of the variance in performance, whereas it accounted for 0 percent of the variance afterwards. This decrement in variance was significant ($t_{83} = 5.89$, $p < .01$). Thus, Hypothesis 4a received partial support and Hypothesis 4b, full support.

DISCUSSION

The complementary roles of goal setting and feedback were examined using an exercise simulating stock market investment. We expected goal setting to interact with outcome and process feedback to affect performance, quality of task strategy, appropriateness of information search, self-confidence, and self-rated effort. The results support the hypotheses and suggest several boundary conditions for predicting goal-setting effects. Process feedback interacted with goal setting to strongly affect the quality of people's task strategies and information search; outcome feedback interacted with goal setting to affect effort and self-confidence. It is also interesting to note that the highest mean level of performance was associated with the combination of the specific, challenging goal and both forms of specific feedback, suggesting that the effects of the two types of feedback may be additive.

The purpose of this research was twofold: to investigate the potential moderating influence of outcome and process feedback in the relation of goal setting to task performance and to explore several variables thought to intervene in that moderation. Although evidence existed for outcome feedback's moderating role in the relation of performance to goal setting (e.g., Bandura & Cervone, 1983, 1986; Erez, 1977; Frost & Mahoney, 1976), it had not been clear why that effect occurred. This study offers two self-reactive variables—effort and self-confidence—as the intervening mechanisms accounting for outcome feedback's effect. Further, the results of this study extend previous research by focusing attention on the criticality of feedback specificity. Another contribution of this study is its test of the theoretical argument that feedback directs an individual's attention to relevant job behaviors and away from irrelevant or inappropriate ones. The process feedback manipulation used here had a clear and direct effect on the quality of subjects' task strategies and their use. Thus, the study demonstrates that various forms of feedback differentially moderate the impact of goal setting on task performance.

Perhaps a more fundamental question is why this interaction takes place. Several researchers (Bandura & Cervone, 1986; Locke & Latham, 1990; Matsui et al., 1983; Wood & Bandura, 1987) have argued that outcome feedback and goals interact as the result of a self-reactive state induced by a discrepancy between goal and performance. Given a small discrepancy, people will be satisfied and maintain their performance level. A large discrepancy that dissatisfies them, however, may trigger additional effort (Bandura & Cervone, 1986; Locke & Latham, 1988).

This explanation relies heavily on feedback's self-reactive influence on people's efforts but does not seem to incorporate any interpretation of its effect on strategy. The process feedback intervention in this study demonstrated feedback's role as a cueing device. The information aspect of feedback enhances performance by aiding the development of information search and task strategy (Earley, 1988; Earley, Wojnaroski, & Prest, 1987; Wood & Bandura, 1987). Goal setting and process feedback interact to shape the effectiveness of task strategy. Analysis revealed that certain combinations of process feedback and goal setting had a powerful influence on the quality of information search and task strategy. The investment strategies of individuals who received both the specific, challenging goal and specific process feedback were superior to those of the other subjects. The process feedback did not provide an investment strategy, but it did alert subjects to which information to use in developing their own strategies. Thus, feedback as a cueing device or tool for strategy implementation seems an important avenue for explaining the goal-feedback interaction.

Feedback is a multidimensional construct that can be described in terms of attributes like evaluative form, specificity, and frequency (Ilgen et al., 1979). This study explicitly manipulated the specificity of feedback on two separate dimensions. We provided process feedback concerning people's prior purchases and sales and the information they had sought from the data

base as well as evaluative comments concerning the usefulness of their data base entries. Outcome feedback consisted of telling subjects the amount of stock and cash they held and their total portfolio values as well as evaluating profit or loss for a given round of the simulation. Both these aspects of feedback specificity demonstrate strong moderating effects on the relation of goal setting to performance. The relative contributions of other forms of feedback are unclear. The evaluative aspect of feedback, for instance, is likely to have a direct bearing on an individual's self-confidence or self-efficacy expectations (Bandura & Cervone, 1986).

Two additional findings deserve mention. First, the interaction of goal setting and outcome feedback was significant for task-strategy quality and information search. This interaction reflects the indirect cueing effect of outcome feedback we described in the introduction. However, the effect sizes for this interaction were much smaller than those for the interaction between goal setting and process feedback. Using process feedback with goal setting appears to be a direct and powerful way of shaping an individual's task strategy, and using outcome feedback is a much less efficient way of shaping strategy. Also, self-confidence was high for individuals given specific outcome feedback but a general goal. Individuals in these conditions had high self-confidence even though their performances were quite poor compared to those of subjects in the other conditions. This result suggests that giving specific outcome feedback alone may lure people into a false sense of confidence, which could have implications for long-term performance.

As with any study, this investigation was subject to limitations. Although we used multiple trials to provide a dynamic view of the relation of feedback and performance, the study was still limited in its longitudinal development. Further, the relevance of the subjects' likely enjoyment of the simulation is unclear, though we do know that the face validity of the task makes it extremely involving for business students.

This study's results reinforce the thesis that feedback moderates goal setting's relation to performance and that both outcome and process feedback are important contributors to goal-setting effects. Further, we investigated several intervening variables—the quality of task strategy, information search, effort, and self-confidence—and found that they were subject to the same moderator effects as performance. Future research should continue to explore the informational influences of feedback in addition to the currently emphasized discrepancies between goal and performance.

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INCREASED ENVIRONMENTAL UNCERTAINTY AND CHANGES IN BOARD LINKAGE PATTERNS

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Increases in competitive uncertainty and resource dependence accompanied the deregulation of the airline industry. In such a situation, firms might use interlocking among boards of directors as a coping strategy. This study examined whether changes in board interlocking occurred with deregulation. Measures of direct head-to-head competition, indirect interlocking among competitors, and individual firms' financial dependence and performance allowed tests of hypotheses that would not have been possible with cross-sectional research. Results showed that indirect board interlocking was focused among competitors and that the focusing increased with industry uncertainty and the distance between firms' headquarters. Direct interlocking with financial institutions increased according to changes in individual firms' financial dependence and financial performance.

The period during which deregulation of the U.S. airline industry went into effect was characterized by traumatic structural change that affected the industry's competitive environment and its relationships with the financial sector. New competitive uncertainty and financial sector restraint in providing capital accompanied the federal government's withdrawal from the regulation of airline competition (Howard, Hart, & Glembocki, 1982). These events provide a unique opportunity to study changes in interfirm relationships.

As firm interdependencies have had increasingly greater influence on firm performance, interfirm coping strategies seem to have become a more important part of competitive strategy (Aldrich, 1979; Astley, 1984; Bresser & Harl, 1986; Pennings, 1981). Previous research led us to expect that firms would change their interorganizational strategies in response to structural changes in their industry and shocks initiated by significant environmental actors (like the government) that affect an entire industry (Burt, 1983; Huff, 1982). Although there are many possible causes of industry changes and a variety of possible responses, this study's purpose was to help refine understanding of one coping strategy: interlocking directorates. We studied both direct interlocks, which occur either when two firms share a director or when an executive of one firm sits on the board of a second, and indirect interlocks, which occur when two firms have directors who are also on the board of a third firm.

Many theses about interorganizational relationships and strategy have been based on cross-sectional research with an industry or sector as the unit of analysis (Palmer, Friedland, & Singh, 1986). The pitfalls of drawing firm-level inferences from such ecological data are well recognized, and these inferences do not always inform researchers' understanding of strategy as a firm-specific phenomenon. Granovetter (1985), Pfeffer (1987), and Bearden (1986) called for more time-dependent, dynamic analysis of interfirm arrangements so that analysis could move beyond the static correlates of cross-sectional design.

We propose that changes in interlocks between boards of directors are not only related to overall industry conditions but also to firms' individual situations. Given the cross-sectional designs of most earlier studies of interlocking, few of them have been able to examine the effects of both industry dynamics and individual firm situations. Typically, earlier research has accounted for differences in neither the head-to-head competitiveness of firms within an industry nor their individual financial performances. It has also not measured indirect directorial interlocking among competitors as a coping strategy. Here, we report an exploratory investigation of these issues in the airline industry during the implementation of deregulation, a period of precipitous change.

UNCERTAINTY, INTERDEPENDENCIES, AND BOARD INTERLOCKING

Thompson (1967) proposed that organizational uncertainty is derived from failure to understand a task environment and from interdependence with elements of the task environment. Both competitive relationships and resource exchange relationships create webs of interdependencies and uncertainty for firms. Firms often establish various linkages among themselves to help cope with these uncertainties. Pfeffer and Salancik (1978) suggested that one benefit of such linkages is acquisition of information about the activities of other organizations. They saw the establishment of communication links as a necessary, but not sufficient, condition for such further cooperative efforts as joint ventures and mergers.

In particular, previous research has suggested that linkages between boards of directors enable firms to facilitate both resource exchange agreements and competitive confederations (Aldrich & Whetten, 1981; Burt, 1980; Dooley, 1969; Pfeffer, 1972). Linkages are thought to reduce both vertical and horizontal external constraints through facilitating cooperation with regulatory agencies, customers, suppliers, and competitors (Burt, 1980; Granovetter, 1985).

There is good reason to expect individuality among firms and dyads of firms in the use of board interlocks. Firms vary in the amount of power directors exercise according to both their own norms and environmental conditions (Aldrich & Herker, 1977). Firms also vary in their dependence on various providers of resources. Dyads of firms vary in the extent to which the members are in head-to-head competition with one another. The proximity

of their corporate headquarters also affects firms' use of interlocking (Dooley, 1969; Mizruchi, 1982; Palmer et al., 1986). Thus, firms in the same industry are likely to have different patterns of interlocking and to respond differently to changes in their environments. Furthermore, actions by powerful actors, like the government or the financial sector, that appear to affect an entire industry uniformly are likely to affect individual firms differently. The government can, for instance, regulate competitive interdependencies and thus diminish uncertainty (Bresser & Harl, 1986; Pennings, 1981). When a change in government policy removes such regulation, firms are likely to attempt to try to fill the vacuum with coping strategies that provide information and some degree of industry governance. Firms' participation in this process is likely to vary with their competitive positions. Similarly, the use of interlocks with financial sector firms is likely to differ according to individual financial situation (Pennings, 1980).

It should be noted that although predictions about responses to environmental change can be based on traditional equilibrium economic theory (which is at least implicit in most of the foregoing discussion), the more recent evolutionary theory of industry behavior can also inform such predictions. Proponents of traditional economic theory might assume that an increase in interlocking is a rational move toward equilibrium through reducing uncertainty. On the other hand, evolutionary economic theorists (e.g., Nelson & Winter, 1982) might explain the phenomenon as an organizational experiment intended to cope with an environmental change that has made existing routines obsolete; they would not assume motivation toward equilibrium. Similarly, characterizing vertical interlocks as actions aimed at reducing contract costs might enhance explanations for vertical interlocking grounded in resource dependence theory. Interlocking board networks might be coping mechanisms that fall between Williamson's (1975) markets and hierarchies (Thorelli, 1986). As Nelson and Winter (1982) noted, equilibrium theory and evolutionary theory might predict the same patterns of response to environmental change, but the explanations might differ.

In the following sections, we describe changes in the airline industry brought about by deregulation and present hypotheses about how the interlocking of firms and dyads of firms changed according to their different competitive and dependence circumstances.

THE AIRLINE INDUSTRY IN TRANSITION

General Description of the Changes

Beginning in 1976, substantive changes in the regulation of competition in the domestic airline industry transformed the field of competition from one in which firms essentially made tactical decisions in a protected environment to one in which a full range of competitive moves was available in an environment charged with new opportunities and threats (Meyer, Oster, Morgan, Berman, & Strassman, 1981).

The level of regulation of the airline industry grew from the inception of

the Civil Aeronautics Board (CAB) in 1938 to reach a point at which competitive variables were limited to choices about equipment, frequency of flights, and capacity (Fruhan, 1972). Trunk carriers—those firms providing most of the long distance domestic service—were almost totally protected from outside competition. Even established carriers could not, however, easily gain access to new routes. The CAB also controlled prices, but although price changes had to be authorized, airlines could pass costs through to consumers, allowing the companies to target a 12 percent return on investment.

Beginning in 1975, deregulation led to increased flexibility in price competition, access to new routes, and the fall of legal barriers to industry entry and exit. The CAB was abolished in 1985. The postregulation period has been unsettling for the airlines. Robinson and Ward (1983) observed increased price competition and new competitors for the trunk routes. Airlines have made strategic moves to attempt to protect their positions in the new competitive environment. For instance, the hub-and-spoke strategy[1] has become so refined that the major airlines are now attempting to capture feeder traffic into the hubs by giving commuter airlines names that link them to major carriers (e.g., American Eagle, Piedmont Express) and by coordinating schedules. Schedule coordination and single-airline control of a large percentage of a given hub's capacity have again limited price competition in some regions (Phillips, 1985).

The uncertainty of the postregulation period reflects not only the new freedom of action available but also the near inevitability that a wave of industry reactions will follow any significant strategy move by a firm. These reactions are the result of intense interdependence among competitors; the following examples of moves and countermoves will serve to illustrate: When Eastern Airlines forged a strong link with Eastern Metro Express, a battle over passenger flows to Atlanta erupted. Delta Airlines countered by establishing connections with Atlantic Southeast Airlines and offering fare and ticketing advantages similar to Eastern's arrangement (*Aviation Week and Space Technology*, 1982). In another instance, noting that the expansion of service by Continental Airlines had helped to erode their traffic in certain western U.S. markets, United Airlines lowered fares in 60 markets (*Aviation Week and Space Technology*, 1984a). United pointedly limited its actions to the West in order to avoid triggering an industry-wide fare war. Continental responded by lowering fares in 73 more markets, a move that other competitors then matched in 13 markets (*Aviation Week and Space Technology*, 1984b).

Financial pressures have also increased. Trunk carriers' operating profits in 1978 totaled $1.2 billion, but in 1981 they suffered $672 million in

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[1] Phillips describes hub-and-spoke networks as follows: "Aptly named because of their similarity to the hub-and-spoke composition of a wheel, such networks are designed to consolidate flight operations at specific points (hubs) in such a way as to provide optimum traffic flow to and from low-density, city pair markets" (1985: 18).

operating losses. Furthermore, the industry, which was capitalized in 1979 at only $16.4 billion (net book value) faced estimated capital requirements for aircraft replacement and general growth of $22 billion in 1980–84 and needed an additional $65 billion in 1985–89 (Howard et al., 1982). Since 1970, the industry's capital investment needs have exceeded internally generated funds by an increasing margin (Howard et al., 1982), so dependence on outside sources of capital has increased. These observations suggest that significant changes occurred in both competitive uncertainty and financial resource dependencies following deregulation.

Competitive Uncertainty

Pennings (1981) noted that government regulatory agencies generate information and provide channels that help industries forecast and coordinate events and thus reduce uncertainty. Pennings also cited anecdotal evidence that regulatory agencies reduce rivalry among interdependent organizations (Litwak & Rothman, 1970; Montgomery, 1972). We expected, then, that as the role of the CAB diminished, airline industry uncertainty would increase. One objective means of measuring such uncertainty is through assessing the financial volatility of an industry.

Financial volatility measures are based on the proposition that volatility is positively related to firm managers' perceptions of uncertainty and therefore reflects phenomena that affect decision making (Bourgeois, 1985; Snyder & Glueck, 1982; Tosi, Aldag, & Story, 1973). A financial volatility calculation for eight trunk airlines (see the Methods section) showed not only that uncertainty increased but that it increased more than uncertainty in other sectors of the economy. To represent other sectors, we used 107 *Fortune* 500 firms not involved in air transportation that were about the asset value size of the trunk airlines. For both groups, we calculated financial volatility for two time periods: the five years before 1970—well before deregulation—and the five years before 1982, the period of adjustment to deregulation. We used a measure based on annual earnings. Tosi, Aldag, and Story (1973) proposed earnings before interest and taxes as a composite measure of financial volatility, and Downey and Slocum (1975) and Bourgeois (1985) modified this measure, calculating differences between adjacent years to distinguish unexpected changes from trends. The formula we used appears in the Appendix. Figure 1 shows volatility for the nonairline and trunk airline groups. For the nonairlines, the means differ only slightly over the two periods, but for the airlines, the means differ dramatically. From an initial absolute value of 2.30 in 1970 the volatility index increases to 8.63 in 1982 ($F = 14.52$, $p < .001$). Thus, objective measurement seems to support the widely held subjective judgments of increased uncertainty in the airline industry.

Financial Dependence

A look at a frequently used indicator of financial dependence, the debt ratio, supports the view that the financial situation of the airline industry has

FIGURE 1
Financial Volatility for Trunk Airlines and Nonairlines
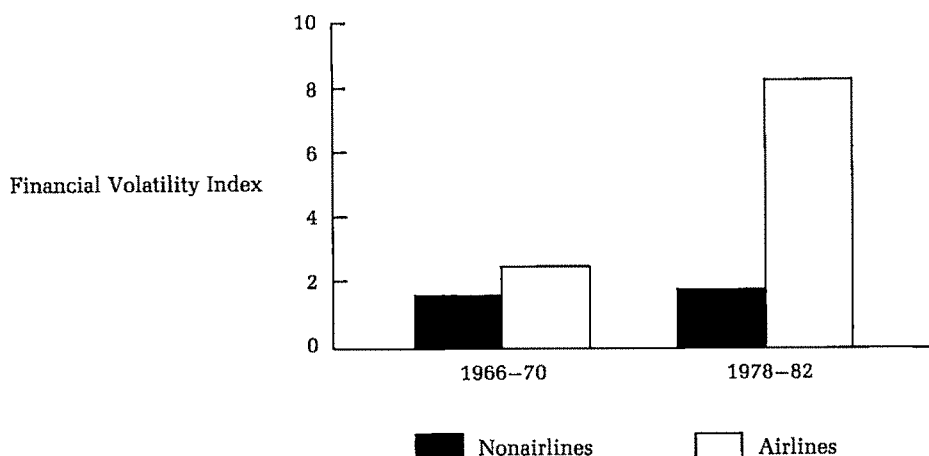
generally been deteriorating. We obtained information on the airlines' debt ratios from *Standard & Poor's Industry Survey* for the years 1977 through 1983. However, even the average increase in firms' debt ratios from 0.576 in 1976 to 0.706 in 1982 may understate the industry's increased financial dependence. In 1976, some financial firms actually placed a moratorium on new lending to airlines because of the industry's poor profit performance (*Standard & Poor's Industry Survey*, 1977). During 1977–82, the average return on investment (ROI) for the eight trunk airlines was 0.33 percent, while all U.S. manufacturing firms achieved an average 13.75 percent. This low ROI also led to difficulty in obtaining equity financing at a time when experts felt that the industry would need an ROI of 13–15 percent to become attractive (Howard et al., 1982). All these factors indicate a general increase in financial constraints for an industry anticipating large capital needs.

However, although financial dependence clearly increased for the industry as a whole, there also seems to have been wide variance in the dependence of individual firms according to their debt and performance levels. In the words of one observer, "Since earnings history and prospects represent the principal criteria according to which lenders distribute funds, carriers demonstrating a better record of profitability will be favored by lending institutions, while less profitable airlines will be neglected" (Biederman, 1982: 73).

Assuming that, under norms of rationality, firms attempt to cope with uncertainty by acquiring information and regulating transactions (Thompson, 1967), we expected changes in the interlocking of boards of directors to have accompanied the dramatic changes just described. We also expected that reactions would not have been uniform across the airlines industry but dependent on the situations of individual firms.

HYPOTHESES

Competitor Interdependence

Burt (1979) defined firms providing similar services within a common competitive space as "structurally equivalent.' Previous research has often defined structural equivalence as categorization in the same two- or four-digit Standard Industrial Classification (SIC) code. Burt hypothesized that structurally equivalent firms should exhibit high levels of interlocking in order to facilitate interfirm coordination. Initally, however, Burt, Christman, and Kilburn (1980) found only weak support for this hypothesis. Burt (1983) subsequently reported a stronger, curv linear relationship between direct interlocks and a measure of such intraindustry market restrictions as constraints on competitive actions by industry structure, competitors, and so forth at both the two- and four-digit SIC levels. Results like these are sometimes interpreted to provide inferences about how competitive firms interact. However, Zajac, working with SIC code groupings, concluded that "most interlocks previously identified as between competitors are actually between non-competing firms" (1988: 436). We also contend that by simply considering firms in the same SIC code as competitors, a researcher might classify many pairs of firms as competing when, in fact, there may be little or no competition between them. Firms in the same SIC sector, for instance, might operate locally in different geographic regions, as do local and commuter airlines, or firms in the same sector might provide such different products or services that there is little competitive interdependence. Therefore, a more direct measure of head-to-head competition seems necessary to test hypotheses about interorganizational linkages among competitors. The airline industry's extensive documentation of route traffic allows for such a measure by providing information on the routes in which airlines compete directly.

The phenomenon of interlocking directorates among competitors also provides an interesting problem for researchers, since the Clayton Act of 1912 prohibits direct competitor interlocking. However, indirect interlocks, which occur when directors from two firms sit on the board of a third, host firm, are legal and to be expected among competitors (Burt, 1980; Vance, 1983). Although Pennings (1980) was skeptical of their value, Burt (1982, 1983) proposed that indirect interlocks through financial institutions could be efficient, if somewhat "noisy," communication links. In his theory of "weak ties," Granovetter (1972: 127) suggested that indirect links create channels that in some circumstances may be more pragmatic than direct interlocks. Given an absence of direct interlocking among airlines, investigating indirect links seemed warranted, particularly since there has been little, if any, previous systematic investigation of indirect interlocking among competitors in any industry.

By extension, earlier research on structural equivalence led us to expect a relationship between indirect interlocking and head-to-head competition. Moreover, Pfeffer and Salancik proposed that "Linkages arise when commu-

nication is most necessary between interdependent others" (1978: 146). Since deregulation removed a mechanism of coordination and increased competitive uncertainty, it seemed likely that indirect interlocking among competitors, especially head-to-head competitors, would have increased.

> *Hypothesis 1a: When competitive uncertainty increases, the strength of the relationship between the intensity of indirect board-of-directors interlocking and the intensity of head-to-head competition will increase.*

Prominent among explanations for interlocking relationships between competitors are firms' sizes and the geographical distances between their headquarters. Since competitive domain and board size tend to vary with firm size (Allen, 1974; Burt, 1980; Dooley, 1969; Pfeffer, 1972), it may be possible to obtain spurious correlations if firm size is not accounted for. Therefore, we stated our hypotheses in terms of *intensity*; for interlocking, intensity refers to the proportion of a firm's indirect board interlocks that are with a given competitor (Pennings, 1980). Analogously, we also stated competition in terms of intensity; for competition, intensity refers to the proportion of a firm's routes that are served also by a given competitor.

It is often argued that firms with nearby headquarters naturally have many interlocks because of convenience and the number of opportunities for contacts that exist. The distances between firm headquarters and interlocking have been shown to be negatively related (Dooley, 1969; Mintz & Schwartz, 1985; Mizruchi, 1982; Palmer et al., 1986). Although this relationship has theoretical significance for those who interpret interlocking as a tool of elite groups controlling corporations, the phenomenon is also important here in that changes in headquarters' locations rather than in competition might explain changes in interlocking. In general, we expected a negative relationship between the distance between headquarters and the intensity of indirect interlocking. With the increased uncertainty of deregulation, however, competitors might need to interlock despite long distances (Palmer et al., 1986).

> *Hypothesis 1b: When competitive uncertainty increases, the strength of the negative relationship between the intensity of indirect board interlocking and the distance between competitors' headquarters will decrease.*

The joint effects of competition and distance might explain this change. In addition, contacts through social clubs, local politics, professional societies, and so forth might serve to ease communication at a close range, but board interlocking might be a more viable vehicle at great distances (Palmer et al., 1986).

> *Hypothesis 1c: When competitive uncertainty increases, firms with distant headquarters will show a stronger relationship between the intensity of indirect board interlocking and the intensity of head-to-head competition than will firms with closer headquarters.*

Hypothesis 1a suggests that the relationship between competition and

interlocking will change with increased industry uncertainty, but the current longitudinal research setting also allowed for a more stringent reasoning that is logically different, though conceptually compatible. This reasoning is that over the period of deregulation implementation, a direct relationship between changes in head-to-head competitive intensity and changes in the intensity of indirect interlocking would have emerged. Hypothesis 1a does not indicate the means through which the relationship will generally increase, but our next hypothesis suggests that the stronger relationship reflects a match between changes in competition and changes in indirect interlocking.

> Hypothesis 2: In a period of changing competitive uncertainty, changes in head-to-head competition and changes in the intensity of indirect board-of-directors interlocking have a direct relationship.

Resource Dependence

Thompson (1967) proposed that dependence on constraining elements of a task environment is the obverse of power: the greater the need for the resource an element provides, the greater the tendency to manage the dependence through negotiation, buffering, or adaptation. Burt (1980, 1983), drawing on this rationale and the theory of structural autonomy (Burt, 1979), showed that board interlocks are more likely to exist between sectors when one sector constrains the other's market. Financial institutions provide such constraints for many other sectors. A number of studies have documented the existence of extensive direct board interlocking with financial firms (e.g., Allen, 1974; Koenig, Gogel, & Sonquist, 1979; Levine, 1972; Mariolis, 1975; Pfeffer, 1972). However, a positive relationship between financial dependence and directorial interlocking has not been observed consistently.

One reason for the lack of consistency might be that in some dependency situations, earlier linking strategy actions like mergers, acquisitions, and joint ventures might preempt expected patterns of board interlocking. If firms have established ongoing relationships with financial institutions through coping strategies that do not rely on board interlocking, and if these strategies differ from firm to firm, a static correlation between dependence and interlocks might not consistently reveal direct interlocking patterns. Such alternative actions are consistent with (1) Williamson's (1975) prediction that firms will seek alternatives to markets when transaction costs are high, (2) current networking dependency perspectives (Pennings, 1981; Pfeffer, 1972, 1987; Pfeffer & Salancik, 1978), and (3) Thorelli's (1986) reconciliation of those two perspectives. Burt (1980), for instance, implied that static measures are inadequate when he found a negative relationship between capital intensity and financial linking. He concluded that highly capital intensive firms interlock proportionately less with financial institutions than do less capital intensive firms because the former have resorted to other buffering tactics, such as acquisition.

However, if dependence increases and a heretofore satisfactory relation-

ship with the financial sector is disturbed, resource dependence theory suggests the possibility that firms might add board-of-directors interlocks with the financial community, perhaps using such interlocking as a short-term solution before finding more permanent mechanisms. Observations of such change behavior, which might well provide a more sensitive and reliable test of the theory at the firm level of analysis than static measures have provided, can only be accomplished through longitudinal observation.

> *Hypothesis 3a: Firms with high increases in financial dependence will increase the proportion of their direct board interlocks with financial institutions more than will firms with lower increases in financial dependence.*

It also seems likely that when an industry as a whole becomes more dependent on the financial sector, individual firms will tend to interlock with financial institutions according to changes in their individual levels of dependence.

> *Hypothesis 3b: When overall industry financial dependence increases, the strength of the relationship between changes in firm financial dependence and changes in the proportion of direct board interlocks to financial institutions will increase.*

The evidence we provided earlier documented the importance of financing for the airlines. However, Pennings (1980) suggested that increased financial dependence might not bring a universal increase in the intensity of linkage to the financial sector. Financial firms might not have wanted links with certain airlines because of perceived risk and potential threat to the financial institutions' images. Dependence theory further suggests that linkages to the financial sector should be positively related to airline performance in times of increased uncertainty (Pfeffer & Salancik, 1978).

> *Hypothesis 4: In an industry with high financial dependence, firms with good profit performance will increase the proportion of their total direct board interlocks with financial institutions more than will firms with poor profit performance.*

METHODS

In general, we tested the moderating effect of increased industry uncertainty on interlocking relationships among competitors by observing board interlocks and the posited related variables in 1970, which preceded deregulation, and in 1982, which followed it. The observations and data on volatility presented earlier document that uncertainty increased between those years. Similarly, we tested the moderating effect of increased industry financial dependence on financial interlocking by observing the periods 1970–76 and 1976–82. We used two levels of analysis: for the hypotheses involving relationships between competitors, dyads of firms were the units of analysis, and for the resource dependency hypotheses, individual firms were the units.

During the period of the study, the trunk sector of the airline industry was a well-defined group of firms providing most of the long route service in the United States. Group membership was fairly stable, with 11 firms in 1970 and 9 in 1982. To provide a consistent and comparable data set, we chose the 8 firms that (1) actively participated in the trunk sector before, during, and after deregulation began and (2) had the ability to make independent management decisions without the constraints imposed by bankruptcy.

Variables

A direct interlock between two firms occurs when they share at least one director. Vance (1983) noted that most research on interlocking has ignored executive interlocks, in which an executive of one company sits on the board of another. Useem (1978) showed that the number of executive interlocks among U.S. firms is noteworthy, and Bearden, Atwood, Freitag, Hendricks, Mintz, and Schwartz (1975) showed their importance. Therefore, we included both executive and director interlocks in our direct interlock category. An indirect interlock occurs when two firms have directors or executives who are also on the board of a third firm, which might be in any industry. Sources of data on interlocking were *Standard & Poor's Register of Corporations* and *Standard & Poor's Register of Directors and Executives* for 1971 and 1983.

The measure of *indirect interlocking intensity* for a dyad was defined as the ratio of the number of a dyad member's indirect interlocks within the dyad to its total number of indirect interlocks with all other trunk airlines. Similarly, we defined *head-to-head competition intensity* for a dyad as the ratio of the number of routes in which dyad members were both significant competitors having at least 10 percent of the total passengers to the total number of routes in which the dyad members were significant competitors with all other trunk airlines. The source of these data was the CAB's *Origin-Destination Survey of Airline Passenger Traffic* (Civil Aeronautics Board, 1970, 1982).

Distance between headquarters was calculated as the great circle distance (the shortest distance over the surface of the globe) between the cities housing the headquarters of the firms in each dyad. *Financial interlocking* for each airline was the ratio of direct interlocks with financial sector institutions (banks, investment companies, or insurance firms) to the total number of direct interlocks with all firms. *Financial dependence* for each firm was the ratio of total debt to total assets. Although Pennings (1980) and others have used the debt-to-equity ratio to represent financial dependence, that ratio is nonlinear and tends to overstate dependency at high debt levels. debt-to-assets ratio, however, appears to remain fairly linear at high a characteristic that was particularly important here since the airline was at a high level of debt. Finally, we represented *profit perfor-* the average before-tax return on stockholders' equity over five

Analysis

The 56 dyads formed by the eight competitors were the units of analysis for Hypotheses 1a, 1b, 1c, and 2. Hypotheses 1a and 1b each predict a change in the relationship between two variables from 1970 to 1982. We tested the change in Pearson product-moment correlations from 1970 to 1982 using Darlington's (1975) asymptotic variance z-test (AVZT), a cross-lagged approach that tests the change in correlation coefficients between time periods.

Hypothesis 1c involves multiperiod observations of categorical predictors. Because cell sizes were unequal, we used a repeated-measures general linear model, an appropriate approach when research involves the observation of changes over time (Freund, Littell, & Spector, 1986). Time and distance were the variables of primary interest. We measured distance by splitting the great circle distances between the headquarters of members of dyads into high and low categories. Time was either 1970 or 1982. Since two levels of distance were assessed in each year, we nested distance subgroups within the time variable in order to avoid pooling of variance. We also included coding identifying the eight firms in the model as a control variable, to account for idiosyncratic differences between airlines (Cody & Smith, 1987). The dependent variable was a simple index of the relationship between competition intensity and interlocking intensity, which was the absolute difference between the two for each dyad.

Hypothesis 2 was tested by first calculating for each dyad the change in interlocking intensity from 1970 to 1982 and then the change in competitive intensity over the same period. We then obtained a Pearson product-moment correlation coefficient for the two change variables.

Hypotheses 3a, 3b, and 4 were tested with the eight firms as the units of analysis. The differences between 1970 and 1976 represented changes during a period of relatively low financial dependence, and the differences between 1976 and 1982 represented changes during a period of high dependence. Because the number of firms studied was small, we calculated the Spearman rho for these hypotheses. For Hypotheses 3a and 3b, we calculated correlations of changes in debt ratio with changes in financial interlocking for each of the two periods. Hypothesis 3b simply predicted that the Spearman rho would be higher for the period of greater financial dependence (1976–82). For Hypothesis 4, we correlated profit performance with change in interlocking for the two periods.

RESULTS

Competitor Interdependence

Hypothesis 1a predicts that high competitive uncertainty will strengthen the relationship between the intensity of indirect board interlocking and the intensity of head-to-head competition. The results shown in Table 1 indicate that for the 56 dyads, the correlation between the intensities of interlocking and head-to-head competition was .26 ($p < .05$) in 1970. For

TABLE 1
Means, Standard Deviations, and Intercorrelations[a]

Variables	Means	s.d.	1	2	3	4	5
1. Intensity of indirect interlocks, 1970	0.09	0.15					
2. Intensity of indirect interlocks, 1982	0.14	0.13	.39*				
3. Intensity of head-to-head competition, 1970	0.13	0.08	.26*	.28*			
4. Intensity of head-to-head competition, 1982	0.14	0.10	.35**	.65***	.47*		
5. Distance, 1970[b]	21.09	14.44	−.59***	−.45**	−.46***	−.43**	
6. Distance, 1982[b]	22.36	11.17	−.32*	−.35**	−.37**	−.39**	.78**

  [a] N = 56
  [b] Distance is expressed in hundreds of miles.
     * p < .05
    ** p < .01
   *** p < .001

1982, the correlation increased to .65 (p < .001). Results using the AVZT (shown in Figure 2) indicated that the differences between the years were significant (z = 3.05, p < .001). Findings thereby support Hypothesis 1a. Firms appear to focus their interlocking on their direct competitors, especially when competitive uncertainty is high.

The geographic proximity of corporate headquarters was also examined. Hypothesis 1b predicted that increased uncertainty would weaken negative relationships between distance and interlocking from before deregulation. For 1970, the correlation was −.59 (p < .001); for 1982, it was −.36 (p < .01). The AVZT statistic supported the correlational results (Figure 2) with a value of 4.15 (p < .001). Both the expected negative relationship between distance and interlocking and the predicted decrease in the strength of that relationship emerged.

Hypothesis 1c predicted that when uncertainty is high, the relationship between the intensity of competition and the intensity of interlocking will be stronger for distant firms than for close firms. As shown in Table 2, results obtained with the general linear model were supportive, with R^2 = .48 (p < .001). Distance and time were significant, and there were no significant interactions. Inspection of the cell means for time and distance (Table 3) shows the data's consistency with the direction of Hypothesis 1c. The means show that highly separated dyads in the high uncertainty period (cell B) showed less difference between competitive intensity and interlocking intensity than close dyads (cell C). It appears that when both uncertainty and distance are high, indirect interlocks exist more often between firms that are direct competitors.

The data shown in Table 3 are also consistent with the predictions of Hypothesis 1a. Despite distance, in the more uncertain period dyadic rela-

FIGURE 2
Results of Darlington's Asymptotic z-Test of Correlation Coefficients[a]

Hypothesis 1a
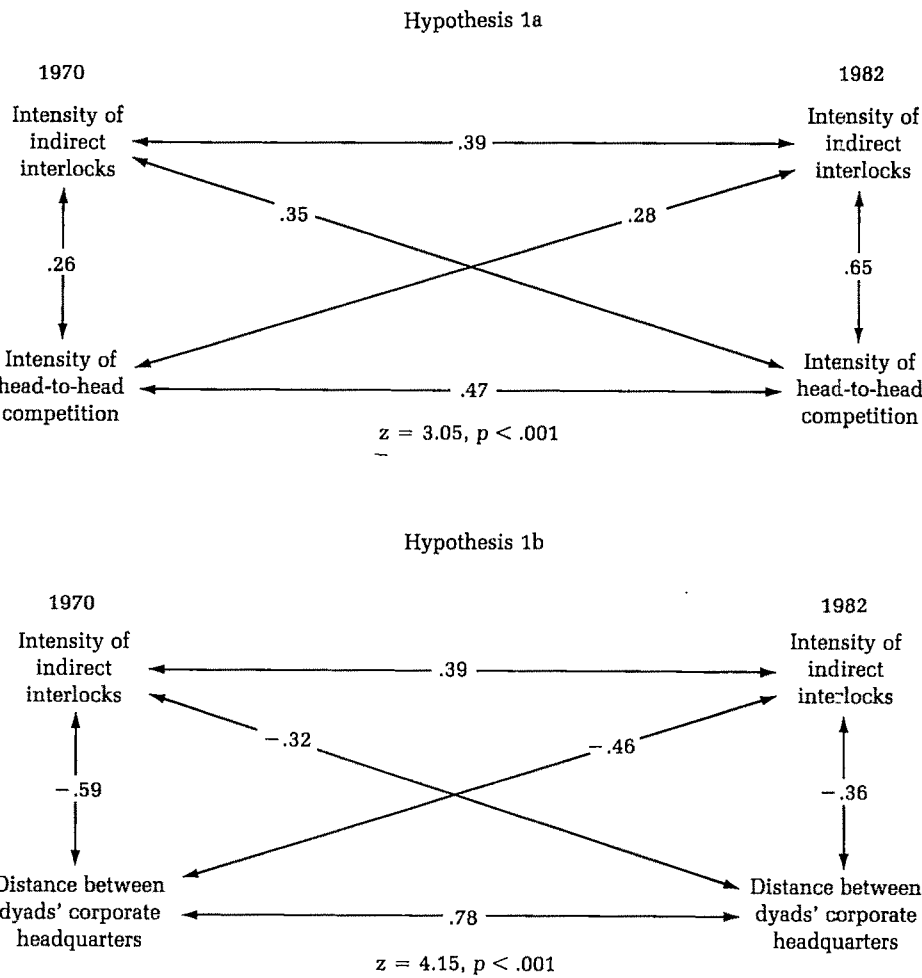
Hypothesis 1b

[a] Coefficients are Pearson product-moment correlations.

tionships between competitive intensity and interlocking intensity were closer; the cell B mean is less than cell A's, and the cell C mean is less than cell D's.

Hypothesis 2 predicted that changes in the intensity of indirect interlocking would directly match changes in the intensity of head-to-head competition. For each of the 56 dyads, we correlated differences in head-to-head competitive intensity between 1970 and 1982 with differences in interlocking intensity. The results show modest support for Hypothesis 2, with a correlation of .24 ($p < .10$).

TABLE 2
Results of Analysis with the General Linear Model[a]

Variables	F	R^2	Coefficient of Variation
Firm	1.44		
Distance (time)[b]	7.34*		
Time	5.58*		
Firm × time	1.53		
Distance × firm (time)[b]	0.91		
Model	2.37**	.48	68.8

[a] Analyses were conducted on 112 dyads.
[b] The distance variable was nested within the time variable.
 * $p < .05$
 ** $p < .001$

Resource Dependence

The inconsistent results of earlier studies led us to expect that static measures of financial dependence might reveal no relationship between the variables of interest and linkages to financial institutions. The data show that static correlations of interlocks for the eight firms and dependency were indeed unimpressive. For 1970, the value of rho was .36, n.s., and for 1982, it was .12, n.s. However, Hypothesis 3a predicted that changes in interlocking would be associated with changes in dependency at the level of individual firms. The correlations of changes (Figures 3 and 4) indicated a tendency for firms to behave as predicted: $\rho = .69$, $p < .05$, and $\rho = .76$, $p < .05$. However, although findings were in the direction predicted by Hypothesis 3b, the relationship for the period of greater overall industry dependence was not impressively higher.

Hypothesis 4 predicted that when financial dependence is high, the relationship between individual firms' profit performance and changes in interlocking with financial institutions will be positive. Positive correlations for both periods studied (1970–76 and 1976–82) provided support. For 1970–76, the value of rho was .61, ($p < .10$), and for 1976–82, it was .77 ($p < .05$). The increase in rho from one period to the next is also consistent with the hypothesis.

TABLE 3
Means for Interlocking Intensity[a]

Distance	Time 1970	1982
High	.10	.06
Low	.16	.08

[a] Clockwise from upper left, cells are designated A, B, C, and D. Cells A and C contained 24 dyads; cells B and D, 32 dyads.

FIGURE 3
Changes in the Debt Ratio Versus Changes in the Proportion of Interlocks
to Financial Institutions for Airlines, 1970–76

Changes in Debt Ratio
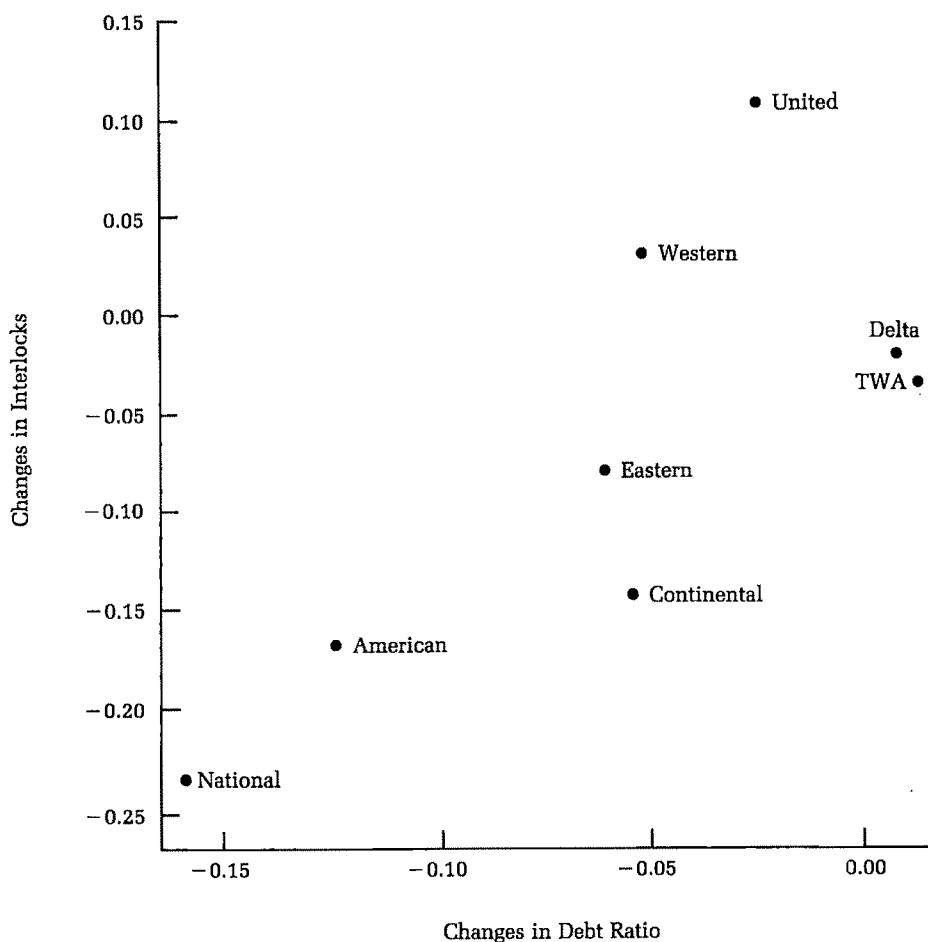
DISCUSSION

By focusing on indirect interlocking and direct competition within an industry, we were able to make more detailed observations of change phe-nomena than have most earlier studies of interlocking. Using competitor dyads and individual firms as the units of analysis, we investigated longi-tudinal issues about which there had previously been only conjecture. Al-though offering those advantages, the natural observation approach taken in this research did not allow for causal inferences regarding the relationships and changes in relationships observed. Indeed, given our design and small data set, the current results should be regarded as exploratory and in need of

FIGURE 4

**Changes in the Debt Ratio Versus Changes in the Proportion of Interlocks
to Financial Institutions for Airlines, 1976–82**
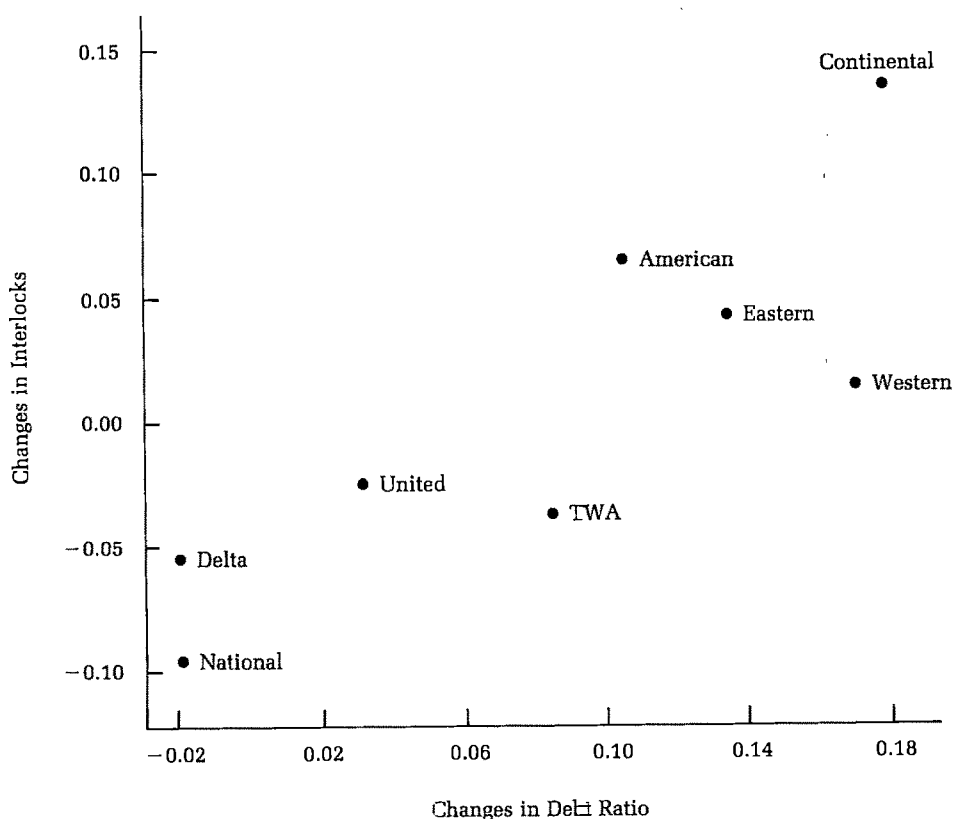
corroboration by studies in other industries. However, these results raise several issues for theory and research on interlocking.

Implications for Competitor Interlocking

To our knowledge, no previous investigation has reported the phenomenon of the focusing of interlocks between head-to-head competitors. Emphasis on direct, rather than indirect, interlocks, misspecification of competition (Zajac, 1988), and definitions of indirect interlocks requiring a financial institution as the intermediary may in part account for this inattention (Burt, 1980). The focusing observed here and the increase in focusing with higher uncertainty suggest additional functions for indirect interlocks as a form of weak tie (Granovetter, 1982).

Granovetter (1972) noted that, in general, weak ties diminish in importance as other paths duplicate the connection they make. Therefore, he maintained that although some weak ties achieve importance by serving as

bridges between strongly linked clusters, "this does not preclude the possibility that most weak ties have no such function" (1972: 130). In contradiction, our results suggest two additional situations in which weak ties can be functional. The first is a situation in which strong ties are not permitted. The prohibition might be legal, as is the case with direct interlocks among competitors. In more general social situations, group or community norms might restrict strong ties. In either event, a weak tie may be better than no tie at all.

The second situation in which weak ties might be functional occurs when the costs of strong ties outweigh their benefits. As noted earlier, theory on board-of-directors interlocks has long held that tight networks among competitors provide market information and reduce competitive uncertainty. On the other hand, the value of interlocking might diminish when market information is otherwise obvious (as in oligopolies), and a pattern of extensive interlocking might not occur (Granovetter, 1985; Pennings, 1981). Moreover, Granovetter (1972) and others (La Porte, 1975; Simon, 1962) have noted that tight networks of strong ties have costs in the form of dysfunctionalities. The loss of autonomy brought about by networking (Aldrich, 1979; Provan, 1982; Thompson & McEwen, 1958; Warren, 1967) might in some circumstances also be a significant cost. In weighing these costs and benefits, firms may not want extensive interlocking with any and all firms who happen to be in the same industry or who happen to sell the same products or services (Bacon & Brown, 1977). Therefore, when the airlines entered the uncharted domain of deregulation, they may have needed to cope with increased uncertainty, but they also needed more strategic autonomy. These conflicting needs might have resulted in a greater focusing of indirect interlocking on the most direct competitors but not in greater overall interlocking. It is possible, then, that when competition poses constraints, indirect interlocks have the advantage not only of legality, but also of being less likely to lead to the sometimes costly clusters typical of strong ties (Granovetter, 1972).

The negative correlation between headquarters distance and indirect interlocking was both expected and consistent with theory. When uncertainty increased, however, the correlation shrunk significantly. Since these links tended to be focused on competitors, this result is also consistent with Granovetter's (1972) observation that weak ties become more important with distance.

The general linear model showed that, even with distance accounted for, the relationship between competition and indirect interlocking significantly increased. Both time and distance were significant, providing the first empirical support to our knowledge for Palmer and colleagues' (1986) conjecture that interdependence and proximity might have a negative interaction effect on indirect interlocking.

Palmer and colleagues also called for more studies of the determinants of network structure after the initiation of the structure. Our test of the matching of changes in indirect interlocking with changes in competitive intensity (Hypothesis 2) addressed that issue. Measuring competition by

counting the number of instances in which firms produced and sold in the same industry, Palmer and colleagues found that ties among competitors were not reconstructed once they were broken. Although the results of the tests of our second hypothesis are not statistically overpowering, their direction suggests the possibility that some ties between Palmer's competitors might not have been reconstructed because there was a corresponding decrease in the extent of head-to-head competition between the firms. The failure to reconstruct might have reflected a dynamic refocusing process rather than a general aversion to interlocking. Thus, the modest relationship observed here suggests the possibility that a more rigorous test of the reconstruction hypothesis might find changes in head-to-head competition to be a moderator of reconstruction behavior.

Implications of Resource Dependence Interlocking

The relationship between changes in resource dependency and changes in direct interlocking found here also conformed better with theory than did results found here using static measures. It may be that change measures are more sensitive, particularly under conditions of high industry dependence. The current results also indicated that considering individual firms' dependency situations might provide better explanations than the aggregated measures of the dependence of one sector on another.

The change relationships we observed might also mean that firms use financial interlocking as a quick response coping strategy (Bearden, 1986) that might then be supplemented or replaced by a more permanent coping strategy if conditions of high dependency persist. Such a role for interlocks would also have implications for the interpretation of interlock reconstruction research.

It may also be that under conditions of high dependence, individual firms' profit performance is more important than it is when an industry's dependence is low. For high industry dependence, it appears that both firm profitability and firm dependence are related to changes in indirect interlocking. Anecdotal evidence from observers of the airline industry indicated the possibility that an interaction of individual firm dependence, overall industry dependence, and firm profitability affects financial interlocking. Empirical investigation of this interaction seems warranted.

In sum, the results show idiosyncratic but predictable changes by firms and competitor dyads when industry-wide changes occurred in uncertainty and resource dependence. These results suggest that such changes might conform more closely with existing theory than research using static, industry-level measures has indicated and that earlier calls for longitudinal, firm-level studies were indeed justified.

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APPENDIX
Calculation of the Financial Volatility Index[a]

$$\text{Volatility} = \frac{\sqrt{\sum_{j=1}^{6} \frac{(y_j - \bar{y})^2}{6}}}{\bar{y}},$$

where

j = the year,

i_j = an industry characteristic (earnings or sales) in year j,

$y_j = i_{j+1} - i_j$, the first difference of i in the jth year of the progression,

and

$\bar{y}$ = the average of the first differences.

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[a] Bourgeois (1985) introduced this calculation.

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EFFECTS OF BOARD DEMOGRAPHY AND DIRECTORS' INCENTIVES ON CORPORATE GREENMAIL DECISIONS

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This study explored the extent to which a board of director's demographic characteristics and the financial incentives of its outside members influence a company's decision to privately repurchase stock from a dissident stockholder. Companies were more likely to refrain from such "greenmail" transactions the longer the average tenure of their outside directors and the more similar the directors' principal occupations. In companies whose top management's equity interests were small, corporate resistance to greenmail was most likely when the outside directors' equity interests were high relative to their board compensation and their lengths of tenure were similar.

The recent merger wave has induced corporate management teams to create various mechanisms to defend their companies against takeovers. One such defense tactic is the targeted repurchase of corporate equity, a transaction that is popularly known as greenmail. In a greenmail transaction, a company privately buys back a block of stock from a dissident stockholder who poses an explicit or potential threat to top management's control position. Similar repurchases are not available to other stockholders, and the dissident stockholder typically receives a significant premium above the prevailing market price. Stockholder rights activists—reformers concerned with assuring that corporate governance serves stockholders' interests—and public opinion have consistently condemned greenmail as detrimental to nonparticipating stockholders, saying that such repurchases deprive them of potential financial benefits created by a takeover (Wall Street Journal, 1987).

Researchers' interpretations of greenmail can be categorized into two schools of thought. Agency theorists have identified greenmail as an act of managerial opportunism in which inefficient executives attempt to prolong their position of control at the cost of a company's long-term performance and stockholders' wealth (Bradley & Wakeman, 1983; Dann & DeAngelo, 1983; Harvard Law Review, 1985). This interpretation of greenmail is grounded in a broader agency theory framework that defines the potential

threat of a takeover as one of several disciplinary forces providing top executives with an incentive to promote stockholders' interests in maximizing the value of a firm (Fama & Jensen, 1983). Removing this incentive through a private stock repurchase is expected to increase the likelihood of future managerial inefficiency and to exacerbate the latent conflict of interests between executives and stockholders. The alternative perspective on greenmail claims that nonparticipating stockholders may actually benefit from greenmail because a dissident stockholder's pursuit of the control of a company signals to the market that the company is undervalued (Macey & McChesney, 1985; Shleifer & Vishny, 1986). This signal is expected to encourage additional and more lucrative bids for the control of the company, yielding higher takeover premiums for the stockholders.

Preliminary tests of the signaling value of greenmail have failed to provide supportive evidence for the latter school of thought (Drieghe, 1986; Holderness & Sheehan, 1985). Moreover, the companies studied here that paid greenmail to a challenging stockholder did not attract significantly more takeover bids in the next five years than a matching group that refrained from paying greenmail.

Although empirical tests of the agency perspective have consistently found that the announcement of a greenmail transaction causes a drop in the value of a firm's stock, findings regarding the extended effects of greenmail on stockholders' wealth have been mixed (Bradley & Wakeman, 1983; Dann & DeAngelo, 1983; Holderness & Sheehan, 1985; Jarrell & Ryngaert, 1984; Shleifer & Vishny, 1986). Yet, the latest and most extensive tests (Mikkelson & Ruback, 1988) have revealed that greenmail negatively affects the value of stockholders' investment if a private stock repurchase is used to eliminate an imminent takeover threat or when a "standstill agreement" accompanies such a transaction.[1] Under these conditions, greenmail has caused significant declines in firms' average abnormal returns.[2]

In sum, current research findings suggest that private stock repurchases are in conflict with stockholders' interests if they are used to thwart an imminent threat for the control of a company.

BOARDS AND GREENMAIL

The realization that top executives can use greenmail to protect their own control position at the cost of stockholders' wealth raises a question about the involvement of boards of directors. As the formal representative of

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[1] In a standstill agreement, a minority stockholder formally promises to limit equity holdings in a company to a certain percentage during a specified period of time in exchange for a lump sum premium.

[2] A company's abnormal return is the difference between the recorded rate of return for the company's stock on a particular trading day and the company's normal rate of return. The normal rate of return is an estimate of the typical return for a company's stock based on a company's risk factors and the rate of return for the total market.

corporate stockholders, it is a board's task to ensure that management's decisions are aligned with stockholders' interests in maximizing the value of a firm and maintaining its dividend policy. A board of directors exercises this governance role by defining the terms of top executives' employment contracts, including their remuneration, and by evaluating and ratifying their proposals for all major strategic decisions, including decisions concerning the firm's long-term objectives, corporate strategies, and capital investments. Boards need, for instance, to formally approve private stock repurchases.

A priori, an effective corporate board would be expected to disapprove of a greenmail transaction that solely served top management's interest in securing its control position in the face of a takeover bid offering reasonable value and inducing favorable projections for a firm's long-term performance. The extant research evidence suggests that a board that ratifies a private stock repurchase under such conditions actually fails to protect stockholders' interests. Of course, the actual motives that drive individual boards to approve greenmail are hard to assess in retrospect. For instance, a particular board may approve a stock repurchase in order to clear the way for another outstanding takeover bid that is clearly more desirable from the stockholders' point of view. And it may be claimed that boards that ratified a private stock repurchase in the early 1980s had no access to the recently published research evidence about greenmail's effect on the value of firms. Nevertheless, it has always been clear that as a private transaction, greenmail discriminates against nonparticipating stockholders who have no access to the substantial premium that is typically part of the greenmail payment (Dann & DeAngelo, 1983). Furthermore, when financed with debt, a greenmail payment causes a transfer of wealth and power away from a company's nonparticipating stockholders because the firm's increased financial risk lowers its market value and decreases the value of future investment opportunities (Brealey & Meyers, 1981: 391).

The purpose of this study was not to assess the motives boards have had when approving greenmail but to identify whether boards that did allow greenmail under an imminent threat for a company's control have distinctive properties that set them apart from boards that refrained from greenmail under the same circumstances. Comparing the characteristics of boards that made the two different decisions under similar conditions will help to identify the factors most relevant for understanding the functioning and motives of boards that face such critical strategic decisions.

In a previous examination of this research question (Kosnik, 1987), I found that boards of directors were most likely to approve greenmail under an imminent takeover threat if they had relatively few outside members and if few of those directors had managerial experience. I considered outside directors to be board members who were not and had never been employees of the company on whose board they sat. In addition, greenmail was more likely the lower the value of top management's equity interests in a company relative to their income from salary and cash bonuses. The findings are

consistent with prevailing arguments in the literature on corporate governance. Board activists consider the independence and qualifications of board members to be critical for effective board performance (*Business Week*, 1989), and studies grounded in agency theory have consistently found that equity ownership by top management reduces the likelihood of acute conflicts of interest between executives and stockholders (e.g., Turk, 1989b; Walkling & Long, 1984).

However, my previous study also revealed some unexpected findings for which the available literature offered no corroboration: Boards whose outside directors owned substantial equity in a company were more likely to approve greenmail than boards whose outside directors owned relatively little equity. Although stock ownership apparently motivated executives to refrain from offering greenmail, it reinforced outside directors' tendency to ratify such transactions. A further fact reinforces the oddness of this finding: in the recent movement toward board reform, equity ownership by outside directors has been strongly recommended either as an important criterion for director selection or as a component of outside directors' compensation. The rationale here is that board members who own equity are expected to be more diligent in protecting the value of stockholders' investments (Bacon & Brown, 1975; *Business Week*, 1989).

The purpose of the present study was to try to explain the past aberrant finding through reexamining the effect of outside directors' stock ownership on the outcome of greenmail decisions. Specifically, this study examined three plausible explanations for my previous (Kosnik, 1987) results. First was the possibility that the absolute size of outside directors' stock ownership might not be an accurate indicator of their commitment to stockholders' interests. It follows from studies of executives' commitment to stockholders' interests (Larcker & Balkcom, 1984; Walkling & Long, 1984) that the ratio of outside directors' equity divided by their cash income from board compensation might be a more comprehensive measure of the incentives influencing outside directors when they weigh the interests of stockholders and management. Second, the 1987 study used outside directors' average equity holdings as a proxy for their commitment to stockholders' interests. However, the mean effect of these equity interests might fail to capture the distributional effect of variation in individual directors' equity holdings. Research on organizational and group demography has illustrated that the distribution of members' attributes affects the performance of groups (Pfeffer, 1983). Accordingly, variation in board members' equity holdings and other relevant demographic attributes might help explain variation in a board's decision whether or not to resist greenmail. Third, a board's role as a guardian of stockholders' interests will be more critical for a company's performance the stronger is top management's inclination to engage in behavior that conflicts with those interests. Therefore, the effect of outside directors' stock ownership on greenmail decisions is likely to depend on the incentives top managers have to pursue a course of action that may be detrimental to the value of a firm.

HYPOTHESES

Board Equity Versus Board Compensation

The unexpected negative relationship between outside directors' equity interests and corporate resistance to greenmail might be due to the fact that the mere size of board members' stockholdings does not accurately reflect their commitment to stockholders' interests. Two observations underlie this proposition. First, in the companies providing data for my previous research (Kosnik, 1987), the average individual stockholdings of the 759 outside directors were significantly smaller than the average equity holdings of the companies' top executives ($p < .05$). Equity ownership is not a prerequisite for serving on a board of directors, and only a minority of companies currently compensate outside board members in the form of stock or stock options (*Business Week*, 1989; *Directors & Boards*, 1988). Given the smallness of the outside directors' equity ownership, its effect might have been more symbolic than motivational.

Second, factors other than equity ownership are likely to drive outside directors' board performance. An important factor to be considered here is their board compensation. Companies typically compensate their outside directors in the form of a uniform annual cash retainer and a fixed fee for each board meeting attended. Board retainers paid by manufacturing firms in 1986 ranged from $2,000 to $40,000, and the median attendance fee was $750 (*Directors & Boards*, 1988). Each committee membership yields an additional retainer and attendance fee. Although the level of board compensation is often related to a company's size and industry membership, it is not systematically related to either company performance or to directors' personal contributions and performance (*Directors & Boards*, 1988). Outside directors may further receive individual benefits and perks, such as liability and life insurance, travel allowances, gifts, and product discounts.

Some authors have argued that high board compensation is a direct cause of board passivity and ineffectiveness because it reinforces outside directors' compliance with management's proposals through impelling directors to protect their board position and the wealth associated with it (Bacon & Brown, 1985; Vance, 1983). Others have argued that, compared to the incomes many directors have from their principal jobs, the compensation for board membership seems inadequate, especially under the current growing pressure for increased board involvement in corporate decision making and the increased liability directors incur (*Directors & Boards*, 1988; *Wall Street Journal*, 1986). No systematic research has tested either argument. However, individual case studies have consistently suggested that a dominating CEO can manipulate outside directors' compensation to promote their compliance with the CEO's wishes (Pickens, 1987; Vance, 1983): several cases have illustrated how boards whose outside directors were highly compensated relative to industry trends tolerated incidents of mismanagement and managerial inefficiency (e.g., *Business Week*, 1987a, 1987b). This anecdotal evidence suggests that, under current trends of board

compensation, the compliance-inducing effect of high board remuneration may be stronger than its motivational impact.

Thus, if stock ownership indeed encourages outside directors to promote stockholders' interests actively, the positive incentive of equity ownership may need to outweigh the negative incentive provided by directors' compensation. Therefore, the ratio resulting from dividing outside directors' average equity ownership by their fixed board compensation should be a more accurate predictor of a board's resistance to a greenmail transaction that is undesirable for stockholders than the absolute size of the outside directors' average equity holdings.[3]

> *Hypothesis 1: The higher outside directors' equity ownership is relative to their cash compensation for board membership, the less likely a board is to approve greenmail.*

Board Demography

The unexpected relationship between the outside directors' average equity holdings and the payment of greenmail that emerged in my 1987 study triggered another question regarding the use of average measures to reflect outside directors' attributes. Researchers who have investigated groups have posited that the combined characteristics and contributions of a group's individual members only partially explain its functioning and performance (Davis, 1969; McGrath, 1984). In addition to contextual and problem-specific variables, interpersonal interactions among group members may induce changes in their individual preferences and behavior, and thus influence the performance of decision-making groups. Average measures of individual members' attributes fail to capture the compositional effects that induce these interpersonal interactions (Pfeffer, 1983). Accordingly, outside directors' average equity holdings might fail to capture fully directors' combined commitment to and diligence in promoting stockholders' interests when facing a greenmail decision. An important compositional variable that may add explanatory power to this relationship is variation in outside directors' attributes. Although the need to study the performance effects of variation among board members has been emphasized before (Morck, Shleifer, & Vishny, 1988), no studies of board performance have actually explored this issue. Yet, the effect of variation in members' attributes on group performance has been well documented in the literature on groups and organizational demography.

Compared to groups whose members have diverse backgrounds and specialties, homogeneous groups tend to produce less creative, lower-quality decisions (Hackman & Morris, 1975), to be more cohesive, to expe-

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[3] Because no systematic data are available about the value of the benefits and perks that individual outside directors receive, I measured compensation as the fees received for board membership and attendance.

rience stronger pressures toward conformity and consensus, and to be more susceptible to "group think" biases (Janis, 1982). In addition, heterogeneity in age, tenure, or both has been positively related to turnover among vice presidents (Wagner, Pfeffer, & O'Reilly, 1984), faculty members (McCain, O'Reilly, & Pfeffer, 1983) and work team members (O'Reilly, Caldwell, & Barnett, 1989); on the other hand, homogeneity in the tenure and age of project members has been found to affect communication patterns within and outside project groups positively (Zenger & Lawrence, 1989).

The distribution of members' attributes might also be a relevant component in the performance of boards. In an attempt to explain and extend the findings of my 1987 study, I examined the effect of variation in three attributes of outside directors: equity ownership, board tenure, and principal occupation. Research on groups and their demography has identified these attributes as being significantly related to group outcomes, and research on boards and governance has found them to be potentially relevant for understanding board and company performance (Kosnik, 1987; Morck et al., 1988). I expected that boards of directors would directly or indirectly benefit from having outside directors who were heterogeneous with respect to the attributes studied, all else being equal. Board activists' advocacy of well-balanced, diversified boards also supports this premise. Ever since the publication of the sociological interpretation of corporate boards as the domain of a propertied ruling elite (Mills, 1956: 123), critics have continuously attacked the club-like atmosphere of boards as the greatest cause of their passivity and failure (e.g., Herman, 1981; Vance, 1983). In response, reformers have strongly recommended pluralism and diversity in a board's composition to avoid the threat of board complacency (Bacon & Brown, 1975; Business Week, 1987a, 1989; McAlmon, 1981; Waldo, 1985).

Equity ownership. It seems obvious that a high stake in a company's outstanding equity should provide individual directors, executives, and stockholders with a strong incentive to promote company activities that increase a company's value and thus the value of their own investment (Jensen & Warner, 1988). When an individual is part of a team or larger entity, however, the group context may alter the motivational effect of personal stock ownership. "Free-riding" or "social loafing" is a potential liability of groups in general (Albanese & Van Fleet, 1985), and agency theorists have identified it as an inherent problem in the governance of top management teams when stock ownership is dispersed (Alchian & Demsetz, 1972; Shleifer & Vishny, 1986). As the number of shareholders in a company increases, small shareholders do not have a big enough stake to justify the cost and effort of closely monitoring management's performance (Shleifer & Vishny, 1986). Rather, small stockholders are likely to free-ride on the monitoring efforts of larger stockholders. Two factors encourage such shirking: (1) as individual stockholders' stakes are small, their potential losses due to poor management are also small. (2) It is hard to delineate each stockholder's individual contribution to the global monitoring performance of a firm's stockholders (Alchian & Demsetz, 1972).

Outside directors whose stock ownership in a company is small may have the same tendency to free-ride as small stockholders. Since variations in a firm's value will have only a negligible impact on their personal wealth and the remuneration for their board services is not related to their individual performance, they have less economic incentive to monitor top management's performance actively than do outside directors who own a significant amount of stock in the company. The ultimate commitment of a board to defend stockholders' interests actively—for instance, by vetoing a greenmail transaction that serves to protect top management's control—may therefore depend on the presence on the board of one or a few large stockholders whose personal stake in the company will impel them to initiate and encourage critical assessments of management's proposals. This proposition draws further support from the findings of experimental research on groups and coalitions suggesting that, to the extent that outside directors with negligible equity holdings have no initial preference for certain decision outcomes, board members with large equity holdings are likely to initiate and lead coalitions with low-stake board members (Miller & Komorita, 1987) and to be highly influential in a board's ultimate decisions (Davis, 1969: 69).

Thus, given two boards whose outside directors on the average own similar stakes in their companies, I would expect a board with equal distribution of equity holdings among outside directors to be more vulnerable to free-riding and less active in monitoring top management than a board with highly concentrated equity ownership and great variation in the size of the outside directors' stakes.

> *Hypothesis 2: Heterogeneity in outside directors' equity*
> *holdings will reinforce a proposed positive relationship*
> *between a ratio of their equity holdings to cash compen-*
> *sation and corporate resistance to greenmail.*

Length of tenure. Research on groups and organizational demography has suggested that both the average length of tenure in a group and the distribution of tenure among members are relevant to individual and group performance. Because little evidence is available about the effect of outside directors' lengths of tenure on board performance, this relationship needs to be better defined before the effects of the distribution of those tenures on greenmail decisions can be explored.

At the individual level, seniority in a group or organization has been associated with a growing commitment to staying with that organization (Buchanan, 1974), increased reliance on standard practices and traditions (Katz, 1982), and increased conformity to the values and expectations of organizational leaders (Salancik, 1977). Although the length of an individual's tenure in an organization contributes to the person's job-specific knowledge, creativity and openness to new ideas are typically highest when someone first joins an organization (Pfeffer, 1983). However, group members are also more susceptible to group pressures for conformity when they are uncertain about a work environment, lack confidence, or strongly value membership in the group (McGrath, 1984), conditions that may all charac-

terize group members with low tenure. Several empirical studies have found that the combination of those forces induces a curvilinear relationship between the average tenure of members of project groups and R&D teams and group performance, with performance being highest when the average tenure approaches the median (e.g., Katz, 1982; Pelz & Andrews, 1976).

Accordingly, I expected a similar inverted U-form relationship between the average length of outside directors' tenures and a board's ability to protect stockholders' interests in a greenmail decision. On the one hand, effective performance as an outside director is said to require three to five years of hands-on learning about a company and its environment (Bacon & Brown, 1975). So although new and junior outside directors are often praised for their fresh and independent perspective (Business Week, 1989), their lack of firm-specific knowledge might work against them when they try to influence board decisions. And as group research has suggested, their junior status might prevent them from "rocking the boat" because they lack confidence and seek recognition and belongingness. On the other hand, senior board members can provide a board with superior insights about a company's operations and with the continuity needed when the company experiences turnover among its top executives. However, that same longevity may interfere with senior directors' ability to bring about change or intervene in top management's decisions when necessary (Weidenbaum, 1984). Many studies of poor managerial performance or mismanagement have identified cases in which a board that had experienced very little turnover and was therefore mainly composed of senior directors tolerated top management inefficiency (e.g., Business Week, 1987a, 1987b; Vance, 1983).

> Hypothesis 3: There will be a curvilinear relationship between the average length of tenure of a board's outside directors and a company's resistance to greenmail.

The distribution of outside directors' tenure lengths should have an additional effect on the outcome of greenmail decisions. Previous research has found that homogeneity in the tenure distribution of work groups directly fosters their social integration (O'Reilly et al., 1989) and the frequency of external communication (Zenger & Lawrence, 1989) and indirectly reduces group turnover (O'Reilly et al., 1989). It has been suggested that similarity in tenure facilitates group members' mutual attraction and interaction, as they undergo similar experiences and develop common perspectives (O'Reilly et al., 1989).

Low turnover and high social integration might be less desirable for boards of directors than for work teams, however. In the ongoing debate about whether or not boards can effectively oversee executives' performance, passivity and complacency among outside directors are among the most frequently quoted causes of board failure (Herman, 1981; Vance, 1983). These characteristics are more likely to be found when tenures are homogeneous rather than heterogeneous because directors who joined a board at similar dates are more likely to interact and form cohorts (Pfeffer, 1983). As the cohesiveness of these cohorts increases, pressures for conformity may

increase, which in turn may reinforce compliance with implied or espoused group preferences and impede the exploration of multiple alternatives when the board makes decisions (Janis, 1982). In addition, outside directors with similar lengths of tenure have been exposed to the same board experiences; therefore, the combined pool of experience and wisdom they can draw from is likely to be smaller than it is for boards with heterogeneous tenure distributions. Both outcomes of tenure homogeneity are likely to induce a preference for courses of action consistent with past decisions and may therefore discourage critical evaluations of new problems (Janis, 1982). In other words, outside directors with similar lengths of tenure may be less able to assess top management performance and proposals critically through open discussions and confrontations. Therefore,

> *Hypothesis 4: There will be a positive relationship between a company's resistance to greenmail and heterogeneity in the lengths of outside directors' tenures.*

Occupation. Diversity in outside directors' principal occupations may be another critical factor in the formation of a well-balanced and active board. Board activists have generally recommended that companies recruit outside directors on the basis of their functional expertise, specialized knowledge, or links with certain stakeholders (Bacon & Brown, 1975; Waldo, 1985). However, group research (Hackman & Morris, 1975) also suggests that the quality of board decisions will benefit further from the diverse perspectives and wide range of experiences that directors representing varied fields and careers will provide. Diversity in the outside directors' occupations may promote the airing of different perspectives and reduce the probability of complacency and narrow-mindedness in a board's evaluations of executive proposals.

> *Hypothesis 5: There will be a positive relationship between a company's resistance to greenmail and heterogeneity in the occupations of its board's outside directors.*

Incentives Affecting Top Management

Equity ownership by corporate top executives reduces the likelihood that management will engage in behavior detrimental to stockholders' wealth, such as resistance to takeovers, adoption of "poison pills,"[4] and payment of greenmail to a challenging stockholder (Kosnik, 1987; Turk, 1989b; Walkling & Long, 1984). The motivational effect of top management equity interests may actually act as a substitute for the disciplining impact of a board of directors (Fama & Jensen, 1983). When top managers own substantial equity, they have a personal incentive to promote the value of a firm. The monitoring role of the board is therefore less demanding and critical

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[4] A poison pill is a warrant issued by a target company to its stockholders which gives them the legal right to buy shares of the target or the acquiring company at a price below the market value, thereby making the acquisition unattractive.

than it is when management equity is low. Alternatively, when a company's top managers have a negligible stake, they will have low economic incentive to pursue stockholders' interests, and the board will play a decisive role in ensuring that top management's decisions are in line with stockholders' interests. As a result, top managers' incentive to pursue stockholders' interests—as reflected in their equity interests in a company—is likely to influence the relationships between outside directors' attributes and incentives and a board's performance in critical decisions. The effect of outside directors' attributes and the incentives affecting them on a company's greenmail will be strongest when equity ownership by top management is small.

> Hypothesis 6: The size of top management's equity interests will negatively affect the proposed relationships between outside directors' attributes and resistance to greenmail.

METHODS

Data

All 53 U.S. companies that were publicly identified as having paid greenmail between 1979 and 1983 and 57 U.S. companies that I identified as having resisted paying greenmail in the same time period under comparable circumstances provided data for this study. This group of companies is consistent with those of the 1987 study.

Selection of companies involved several steps. I first identified all companies that, between 1979 and 1983, had repurchased 5 percent or more of their outstanding equity at a premium above the market price in a private transaction with a dissident stockholder who threatened the company's management with a takeover or a proxy fight. I specified these different conditions to ensure that all the cases studied had involved an imminent and credible threat for the control of a company.

The companies were identified by screening transactions listed as "Reacquired Shares" in the *Wall Street Journal Index*. To distinguish greenmail transactions from open stock repurchases, I examined the terms of all repurchases between 1979 and 1983 through reading the original articles. The screening yielded 53 greenmail-paying companies for which sufficient data were available for the planned analysis. All were listed on the New York Stock Exchange or the American Stock Exchange. In the average greenmail transaction, a company bought back 13 percent of its outstanding stock at an average premium of 55 percent over the market price.

The second set of companies, those that did not pay greenmail during the same period under conditions similar to the ones faced by the greenmail-paying companies, was then selected. I first listed all stock transactions made by one of eight notorious "raiders"—Carl Icahn, Victor Posner, Irwin Jacobs, David Murdock, Saul Steinberg, Carl Lindner, the Belzberg family, or the Bass brothers—and all companies affiliated with them between 1979 and 1983, drawing on reports in the *Wall Street Journal Index*. The raiders

were chosen on the basis of well-established reputations as aggressive green-mail hunters in the popular business press (e.g., *Business Week*, 1985; *Fortune*, 1985; Holderness & Sheehan, 1985). Each had also triggered at least one greenmail transaction between 1979 and 1983.

Next, I selected all transactions in which one of the raiders acquired 5 percent or more of a company's outstanding equity amidst rumors or explicit threats for the company's control. I considered an acquisition of a 5 percent block of stock a minimum basis for a credible takeover threat; moreover, stock acquisitions of 5 percent or more have to be reported to the Securities and Exchange Commission (SEC) in a 13D filing.[5] Reports on the raiders' public challenges of top management control positions came from the *Wall Street Journal*, *Business Week*, *Fortune*, and *Insiders' Chronicle*. Finally, I identified those transactions that were followed by a subsequent purchase of equity by the raiders in the year following the initial purchase. Subsequent stock acquisitions by a raider signaled continued interest in building up a significant equity position in a company. The observation period was restricted to one year after a 13D filing because that was the average time between 13D filings and greenmail transactions in the set of greenmail-paying companies. This selection process yielded 57 companies that resisted paying greenmail to a challenging raider.

Measures

Outside directors' attributes. Outside directors' equity interests were measured as a ratio, the value of their common stock[6] over their annual cash compensation for board membership. Board compensation included annual retainers and the annual sum of fees for perfect attendance. Outside directors' tenure was defined as the total number of years a director had served on a board. Both measures were aggregated and averaged across each board's outside directors. Principal occupations were classified into eight categories. A director could be classified as an executive, retired executive, lawyer, banker, consultant or certified public accountant, academic, or professional director, or as holding one of a mixed group of "public jobs," including work in politics, sports, religion, and show business.

Measures of board homogeneity. In a classic review of demographic measures, Allison (1978: 869) suggested the coefficient of variation—the standard deviation divided by the mean—as the best direct scale-invariant measure of dispersion when a variable does not have a diminishing marginal utility or when its utility or value is irrelevant to an analysis. If this condition is not met, as it would not be for measures of income or social rewards, Allison recommended using Theil's index of dispersion, which is defined as

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[5] As the declared intentions of investors filed in 13D statements were found to be very unreliable in predicting eventual takeovers, I did not use them as a criterion.

[6] The dollar value of equity was based on a company's stock price 30 days before a 13D filing to avoid distortions caused by speculation.

$T = 1/n \ \Sigma(x_i/\mu) \ \log(x_i/\mu).$[7] Neither index of dispersion is applicable to interlevel variables without a fixed zero point; in such cases, Allison (1978: 872) recommended using a standard deviation. Accordingly, I used the coefficient of variation to calculate the level of heterogeneity in outside directors' tenure, measured the distribution of their equity with Theil's index, and defined occupational variation using the standard deviation of the eight job categories.

Covariates. My previous research (Kosnik, 1987) found that the payment of greenmail was most likely (1) the lower the value of top management's equity interests in a company relative to their income from salary and cash bonuses, (2) the higher the dispersion of equity among stockholders, and (3) the smaller the proportion of outside directors on a board. Also, greenmail transactions were found to occur more frequently in the oil and gas industry and in consumer products industries, all else being equal. I included those variables as controls in the first part of the analysis, which tests Hypotheses 1 through 5. In testing Hypothesis 6, which predicts an interaction effect between a board's attributes and top management equity interests, I introduced the latter as a moderator variable.

The concentration of stock among stockholders was measured by the average dollar value of equity owned by stockholders who were not represented on a board or were not members of the company's management. Top management's equity interest was measured as the dollar value of stock and options owned by the company's top three executives divided by the combined amount of their annual salaries and cash bonuses. Outside directors were defined as all directors who did not have an employment contract with a company or who had not retired from such employment. Industries were represented by their four-digit Standard Industrial Classification (SIC) codes.

Data collection. All measures were recorded either for the year in which a greenmail transaction was announced or for the year following a raider's acquisition of stock as reported in a 13D report. All data were collected from the companies' proxies. Where possible, I cross-validated data from the proxies against information provided by *Standard and Poor's Industrial Guide* and *Moody's Industrial Manual*.

Analysis

The hypotheses were tested through logistic regression analysis; the dependent variable was the probability that a company had resisted greenmail. I conducted three separate analyses. The first defined the probability of resistance to greenmail as a function of four control variables: top management's equity ratio, stock concentration, industry membership, and the proportion of outside directors on a board. The second logistic function tested the effects proposed in Hypotheses 1 to 5; the model defined the probability

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[7] x_i is the observed value of an individual variable; n is the sample size; μ is the mean value.

of resistance to greenmail as a function of top management's equity ratio, industry membership, the proportion of outside directors, the outside directors' average equity ratio, the interaction between that ratio and the variation in their equity ratios, the curvilinear effect of their average tenure, and the variation in outside directors' tenure and occupations. To test the curvilinear effect of the outside directors' average tenure, I included the quadratic function of that variable.

The third logistic function was set up to examine the interaction effects between the proposed board attributes and top management's equity ratio. Because the number of companies studied restricted the power of the test, I only analyzed the interaction effects for four board attributes: average equity ratio, average tenure, variation in tenure, and variation in occupation. The logistic function defined the probability of greenmail as a function of the three control variables, the main effect of the four board attributes, and the interaction of those attributes with top management's equity ratio. To define the interaction terms, I represented top management's equity ratio by a dichotomous dummy variable set equal to 1 if that ratio was below the median value of the variable's frequency distribution and to 0 for values above the median (Lewis-Beck, 1980).

RESULTS

Table 1 reports the means, standard deviations, and Pearson product-moment correlations among the independent and control variables.

Table 2 presents results of the logistic regression analyses for the three models. The first model evaluates the relative importance of the four control variables in predicting the likelihood that a company will resist greenmail. Findings were consistent with my 1987 findings: companies were more likely to resist greenmail the higher top management's equity interests were relative to their income from salary and cash bonuses and the higher the proportion of outside directors on a board. Industry membership also had a significant effect on the occurrence of greenmail. No significant effect was found for the concentration of stock among stockholders, so I omitted this variable from subsequent analyses in order to increase the power of the tests.

The second logistic regression function tests Hypotheses 1 through 5. With top management's equity ratio, industry, and the proportion of outside directors on a board controlled, outside directors' average tenure affected corporate resistance to greenmail in a positive, linear way, and diversity in outside directors' principal occupations negatively affected it. Outside directors' average equity ratio had no significant direct or moderated effect on resistance to greenmail.

The last logistic regression model tested the joint effect of the outside directors' equity and demographic characteristics and top management's equity interests on resistance to greenmail. Two significant interaction effects emerged: When top management had relatively low equity interests, a company was more likely to resist greenmail the higher the outside directors' equity ratio and the smaller the diversity in their tenures.

TABLE 1
Means, Standard Deviations, and Pearson Product-Moment Correlations[a]

Variables[b]	Means	Standard Deviations	1	2	3	4	5	6	7	8
1. Average equity ratio	103.67	364.00								
2. Equity ratio variation	0.35	0.23	.17*							
3. Average tenure	9.17	3.95	-.05	-.16*						
4. Tenure variation	0.62	0.26	.11	.16*	.00					
5. Occupational variation	2.11	1.08	.07	-.09	-.12	-.07				
6. Industry	3,847.76	1,723.94	-.08	.16*	-.12	.22**	-.01			
7. Stock concentration	1,465.74	1,886.52	.08	.04	-.07	.13†	.00	-.08		
8. Management's equity ratio	878.98	2,700.52	-.04	.06	.06	-.09	-.08	.14†	-.02	
9. Proportion of outsiders on board	0.62	0.16	.14†	.17*	.05	.10	-.06	-.03	.10	-.15†

[a] N = 110.
[b] All equity was measured as the ratio between the value of common stock owned and cash compensation.
† p < .10
* p < .05
** p < .01

TABLE 2
Results of Logistic Regression Analyses[a]

Variables	Model 1	Model 2	Model 3
Constant	0.71*** (11.68)	−7.56† (3.26)	−5.36† (3.07)
Covariates			
Management's equity ratio	0.05*** (11.82)	0.06** (9.74)	0.09 (1.40)
Stock concentration	0.00 (0.10)		
Industry	0.03* (4.77)	0.03* (4.29)	0.21 (0.72)
Proportions of outsiders			
on board	4.22* (5.79)	4.31* (5.03)	4.80† (2.72)
Outside directors' attributes			
Average equity ratio		−0.01 (1.59)	−0.02 (2.86)
Average equity ratio			
× equity ratio variation		0.01 (1.46)	
Average tenure		0.89* (4.31)	0.73* (3.46)
Average tenure squared		−0.02 (2.27)	
Tenure variation		−0.61 (0.38)	−0.05 (0.89)
Occupational variation		−0.63* (3.55)	−0.10† (3.07)
Management's equity ratio			
× average equity ratio			0.06* (4.72)
× average tenure			−0.58 (2.23)
× tenure variation			−4.75* (3.78)
× occupational variation			−1.07 (2.08)
G^{2b}	101.18	94.41	55.93
df	105	100	100

[a] $N = 110$. Numbers in parentheses are the results of chi-square tests of individual parameters.

[b] Goodness-of-fit test: $G^2 = -2 \log (L_0/L_1)$, where L_1 is the value of the likelihood function for the full model as fitted and L_0 is the maximum value of the likelihood function if all coefficients except the intercept are 0.

    † $p < .10$
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

DISCUSSION

This study's objective was to explain and extend the findings of a previous study about the effect of board composition and the incentives affecting outside directors on a company's decision to pay greenmail when facing an imminent takeover threat (Kosnik, 1987). One aberrant finding in particular triggered the present study: a negative relationship between the average equity a board's outside directors owned and that company's resistance to greenmail. This observation is inconsistent with the agency-theory argument that stock ownership provides outside directors with an extra economic incentive to protect stockholders' interests actively when overseeing top management's performance. Previous studies had consistently concluded

that the equity incentive did work for top executives (e.g., Turk, 1989b; Walkling & Long, 1984).

The present study explored three plausible explanations for the inconsistent observation. One suggestion was that the size of the outside directors' equity holdings might not accurately reflect all the incentives they had to promote stockholders' interests diligently. Therefore, I expressed outside directors' equity interests as a ratio between equity and cash compensation for board membership, expecting the latter to reflect directors' beholdenness to the company's CEO or other top executives. In contrast with the 1987 finding, in the present study the value of this equity ratio did not have a direct effect on resistance to greenmail. However, an effect emerged that was conditional upon the relative equity interests of a company's top management: when top executives owned little stock in their company compared to their income from cash compensation, resistance to greenmail was more likely if outside directors owned a large amount of stock relative to their cash compensation. This finding provides support for a second proposal about the previous anomaly: in order to observe the true motivational effect of outside directors' equity ownership, a researcher would need to restrict observations to situations involving an acute conflict of interest between top management and stockholders, so that a board's intervention and its impact on company performance could be more accurately delineated. Consistency between the findings of the current and previous studies (e.g., Turk, 1989b; Walkling & Long, 1984) add credence to the agency-theory argument stating that the smaller the equity ownership of a company's top executives, the lower their personal economic incentive to pursue stockholders' interests, and the more critical the board's governance.

The present research also identified the ratio of outside directors' equity holdings over their board compensation as potentially relevant for explaining the effect of boards on critical decisions like greenmail, even though the effect might be conditional. This study's use of a balanced measure of directors' equity interests and definition of a conditional relationship could account for the absence of the aberrant negative effect found in 1987. However, it should also be noted that the current study used logistic regression analysis and the 1987 study used discriminant analysis. I chose logistic regression analysis here because it does not require a multivariate normal distribution with equal covariance matrixes for the independent variables, as discriminant analysis does; possible violations of this assumption might have made the findings under discriminant analysis statistically less consistent (Fienberg, 1980: 106).

A third proposition explored in this study concerned the effect of board demography on greenmail decisions. I suggested that mean aggregates of directors' attributes, which have traditionally been used as measures of board composition, might not capture the distributional effect of variation in outside directors' equity holdings and other relevant attributes. Findings regarding the effect of board demography on resistance to greenmail were mixed. No support emerged for the proposition that the effect of outside

directors' stock ownership on greenmail might depend on heterogeneity in their equity holdings. Further, I expected a curvilinear relationship between outside directors' average tenure and resistance to greenmail but found a positive linear relationship that was independent of top management's equity interests. It is likely that the expertise and experience of senior board members is responsible for tenure's positive effect. The finding is, however, inconsistent with the claim that tenure induces conservatism among outside directors and reinforces compliance with a company's top executives (Bacon & Brown, 1975; Vance, 1983).

Further findings did not support the claim of many board activists that heterogeneity in board members' attributes promotes board effectiveness. The effect of variation in the lengths of outside directors' tenures on corporate resistance to greenmail was negative and conditional on the ratio between top management's own equity interests and compensation. Contrary to expectations, companies whose top managements had relatively low equity interests were less likely to resist greenmail if their board consisted of outside directors with diverse tenures. Moreover, diversity in outside directors' principal occupations further negatively affected resistance to greenmail, and this effect was independent of top management equity holdings. I expected that diversity in outside directors' tenure and occupations would stimulate the expression of diverse viewpoints and increase the number and quality of alternatives considered when a board made strategic decisions. Instead, the findings suggest that outside directors' heterogeneity in tenure and occupation might impede their ability to relate to each other and reduce the frequency and openness of their interactions when they evaluate top management proposals. This interpretation would be consistent with the observed positive relationship between tenure homogeneity and social integration in work groups (O'Reilly et al., 1989) However, occupational diversity's negative effect on resistance to greenmail is still inconsistent with the well-established premise that homogeneous groups tend to produce less creative, lower-quality decisions than groups whose members have diverse backgrounds and specialties (Hackman & Morris, 1975). It is possible that the potential contribution of outside directors who have a wide range of specialties and experiences is not fully realized in a decision concerning the payment of greenmail to a challenging stockholder. In a greenmail decision, a board's ability to intervene and prevent top management from engaging in a course of action that might diminish stockholders' wealth might be more critical than the board's ability to draw on its outside directors' diverse functional specialties and experiences. Outside directors' areas of expertise and occupations might become more relevant in complex problems requiring creative solutions, such as a reorganization or formulation of a company's long-term strategy and goals.

Also noteworthy is the finding that the effect of tenure heterogeneity was conditional upon top management's equity ownership, but the effect of occupational heterogeneity was not. If we accept the agency-theory premise that low managerial equity interests diminish executives' commitment to

stockholders' interests and heighten the importance of a board's governance role, this obervation suggests that a board's tenure distribution is more critical for its ability to stand up against top management than is diversity in the outside directors' occupations. As suggested above, the outside directors' backgrounds and careers might be more relevant for the content of a board's decisions, and the distribution of lengths of board tenure might be more relevant for the decision-making process and a board's relationship with management.

The effect of board demography on board and company performance clearly warrants more research. One question that the current findings raise concerns the ideal level of heterogeneity among board members: too much diversity might impede board members' interaction, but too little could promote groupthink and complacency, with detrimental implications for corporate governance. If researchers really want to understand how board composition affects both board and management performance, they need to move beyond the traditional insiders-outsiders dichotomy. The available research on board performance has neglected the process aspect of board functioning; instead, it has primarily focused on the outcome of board decisions or on global proxies of company performance. The limited accessibility of data on board dynamics and the limitations archival data and cross-sectional research impose are mainly accountable for this state of affairs. However, it seems very important to use more field studies and surveys in future studies of board performance to overcome these limitations.

The motivational effect of board compensation appears to be another promising topic for future research. Especially now that outside directors are subject to growing scrutiny by stockholders and financial markets and are facing greater liabilities (*Business Week*, 1986), it is important to understand better whether and how board compensation and stock ownership affect outside directors' active involvement in a board's activities as well as their relationship with a company's CEO and top executives. Investigators might successfully apply the principles and methods of research on motivation and compensation to the study of this problem (Kosnik & Bettenhausen, 1988).

This study's findings should be interpreted with caution. Because I chose the companies studied here on the basis of their exposure to a challenging stockholder, these findings should not be extended to other strategic decisions without qualification. However, since the payment of greenmail under an imminent threat for control induces an acute conflict of interest between a company's executives and stockholders, greenmail provides an interesting context for studying the impact of a board's governance. Another limitation of this study is the fact that I only measured board demography for outside directors. In a future study, a comparison of the distribution in the demographic characteristics of inside and outside directors might help explain the relationship between boards and top managements and thus clarify the outcome of certain board decisions.

This study extended available research on boards by examining the

effect of board attributes that had not been systematically related to board or company performance: outside directors' equity interests relative to their board compensation and the distribution of outside directors' board tenure, occupations, and equity interests. Also, this study explored interaction effects between board attributes and the incentives affecting top management for the first time. The present findings suggest that relationships between board attributes and company performance should be interpreted with caution as they might be conditional upon top management incentives to pursue stockholders' interests. The study's results further illustrate how the study of board performance in corporate governance can benefit from applying the principles and findings of research on groups and organizational demography.

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ORGANIZATIONAL FORM, POPULATION DYNAMICS, AND INSTITUTIONAL CHANGE: THE FOUNDING PATTERNS OF VOLUNTARY ORGANIZATIONS

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Questions related to founding are of central importance to the study of organizations. Recent research in organizational ecology has suggested that ecological dynamics—previous foundings, disbandings, and the number of organizations alive—influence founding levels. Major changes in institutional environments also influence new foundings and can alter ecological dynamics. This study investigated whether the relationship between foundings, population dynamics, and institutional changes in a population of voluntary social service organizations differed for specialist (single-domain) and generalist (multiple-domain) organizations. Results generally showed that both ecological dynamics and institutional changes have stronger influences on specialists than on generalists.

The question of organizational creation, or founding, is of fundamental importance to the study of organizations. Understanding the process that culminates in an organizational founding would have significant policy and practical implications as well as great theoretical value. For the most part, theorists have taken the existence of organizations for granted. However, Scott (1987: chapter 7) presented a comprehensive review of relevant literature.

The literature on organizational founding falls into three broad research traditions. The interdisciplinary study of entrepreneurship and new business venturing is one important tradition (for a review, see Low and Mac-

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Millan, 1988). Studies of entrepreneurship are generally relevant to the issue of organizational creation because successful entrepreneurship is usually associated with the creation of a new organization. Students of entrepreneurship have, for example, focused on psychological predictors of entrepreneurship (McClelland, 1967; Sexton & Bowman, 1985); on sociocultural influences on entrepreneurial decision making (Glade, 1967; Vesper, 1983); and on entrepreneurs' embedments in social networks (Aldrich & Zimmer, 1986; MacMillan, 1983). A second tradition in the study of organizational founding is the new institutional economics (Williamson, 1975, 1985). Neoinstitutional economists focus on the transaction-cost efficiencies organizations offer in an economy. When market modes of exchange have overly high transaction costs, markets fail, and transactions get organized in hierarchical organizations. Thus, market failure leads to organizational creation. A third tradition deals with the relationship between environments and the creation of new organizations (Stinchombe, 1965). Most recently, organizational ecologists have pursued work in this last tradition (Delacroix & Carroll, 1983; Hannan & Freeman, 1987; Tucker, Singh, Meinhard, & House, 1988). This article belongs in that tradition.

Since the formulation of its initial theoretical statements about a decade ago (Aldrich, 1979; Hannan & Freeman, 1977) organizational ecology has emerged as a paradigm with growing empirical support. A central question in organizational ecology is how populations of organizations change over time (Carroll, 1984, 1987; Hannan & Freeman, 1977, 1989). The general approach researchers have adopted is investigation of the systematic operation of selection processes in organizational populations. Selection processes usually operate through the differential propensities of organizational forms to enter and exit populations. Researchers have therefore focused on differential disbanding rates of existing organizations (Carroll & Delacroix, 1982; Freeman & Hannan, 1983; Singh, Tucker, & House, 1986; Tucker, Singh & House, 1984) and on differential rates of organizational foundings (Delacroix & Carroll, 1983; Hannan & Freeman, 1987; Pennings, 1982; Tucker, Singh, Meinhard, & House, 1988). The premise that organizations have low propensities to change their forms, particularly in fundamental ways, underlies such research (Hannan & Freeman, 1977, 1989). (However, other research has offered a different view of changes in organizational forms [Aldrich, 1979; Aldrich & Auster, 1986; Singh, Tucker, & Meinhard, 1988].) A growing literature shows general support for the organizational ecological view of how populations change over time (e.g., Carroll & Huo, 1986; Singh, Tucker, & Meinhard, forthcoming).

The current investigation of organizational founding was based on cumulative research evidence suggesting that two sets of forces affect new founding levels: ecological dynamics, which include the effects of previous levels of foundings and disbandings and of density, or the number of organizations alive in a population; and institutional changes. Building on earlier work (Tucker, Singh, Meinhard, & House, 1988), we asked whether ecological dynamics and institutional changes in an organizational popula-

tion differentially affected the founding patterns of single- and multiple-domain organizations. This question is significant because few empirical studies have specifically examined differences in foundings for different organizational forms. Supportive empirical evidence would contribute significantly to ecological research, through emphasizing the importance of differential founding patterns of organizational forms in explaining population change, and to the broader literature on organizational creation.

PREVIOUS RESEARCH ON ORGANIZATIONAL FOUNDINGS

For the most part, recent empirical studies of foundings have examined patterns of founding in relation to organizational environments. This stream of reasoning dates back to an influential essay by Stinchombe (1965) in which he discussed the environmental factors that led to organizational foundings and how the environmental and social conditions prevalent at the time of an organization's founding tended to imprint themselves on the nascent organizational structure. Subsequently, Kimberly (1975), in a study of rehabilitation organizations providing training services to handicapped persons, found relationships between the time of a founding, social conditions at founding, and an organization's orientation. Meyer and Brown (1977), in a study of city, county, and state finance agencies, found that the formalization of personnel procedures depended on the era of origin. Kimberly (1979), in a study of the establishment of a medical school, found that the environment at founding and the founder both had lasting effects on the organization's structure. Later studies have continued to find support for the proposition that environment significantly affects patterns of organizational founding. Pennings (1982), for example, studied organizational founding frequencies in urban areas of the United States in selected industries and found that influences included such sociodemographic and economic factors as occupational and industrial differentiation, the percentage of immigrants in an area, the size of an industry and a metropolitan area, and the availability of financial resources. Marrett (1980) studied the formation of women's medical societies in the United States during the nineteenth century, finding that more medical societies emerged in cities that already had similar medical societies.

The Ecological Dynamics of Organizational Foundings

More recently, ecological studies have related patterns of organizational founding to population dynamics, or the previous patterns of foundings and disbandings in a population, and to density—the total number of organizations in the population. Delacroix and Carroll (1983), in a study of the newspaper industries of Argentina and Ireland during the periods 1800–1900 and 1800–1925 respectively, found that population dynamics and external environmental events accounted for cyclical patterns of organizational foundings. Regarding population dynamics, both prior foundings and disbandings had curvilinear effects (linear term positive, quadratic term negative) on

foundings. Initially, as founding levels rose, each founding appeared to encourage others by offering a model for imitation and by indicating a favorable availability of environmental resources. However, this imitation process led to an overabundance of foundings vis-à-vis environmental resources and helped the total population overshoot the environment's carrying capacity. The resulting increase in competitive pressure led to the number of new foundings declining at higher levels of prior foundings. Similarly, at low levels of previous disbandings, each organizational disbanding created free-floating resources that could easily be reassembled into new organizations. But there was an upper limit to this positive effect of previous disbandings on new foundings, since high levels of disbandings signaled a noxious environment, thereby discouraging potential entrepreneurs.

Hannan and Freeman (1987) explained cyclical patterns of foundings in the population of labor unions in the United States from 1836 to 1985 in terms of the effects of the total number of organizations in a population. Their theoretical argument for density dependence was that as the number of labor unions in the population grew initially, the presence of the first few legitimated the organizational form itself, facilitating the founding of new labor unions. However, as the number of unions grew even further, competition for resources within the population increased, effectively imposing constraints on new foundings. Thus, density had a curvilinear relationship with foundings of labor unions. Hannan and Freeman also showed that previous foundings had a curvilinear relationship with new foundings, a pattern similar to what Delacroix and Carroll (1983) found. Thus, research on the ecological dynamics of organizational foundings has suggested that founding levels have curvilinear relationships with previous levels of foundings, disbandings, and density.

Institutional Environments and Organizational Foundings

Scott points out that the environments of organizations are more than "sources of resources for inputs, information, and knowhow for outputs" (1983: 158). Institutionalized rules and beliefs about the creation of organizations also figure in these environments (Meyer & Rowan, 1977). Other studies have examined the impact of institutional environments on organizational foundings. Recent studies (Carroll & Huo, 1986; Hannan, 1989) have examined the relationship between institutional environments and organizational foundings. Carroll and Huo analyzed organizational foundings, disbandings, and performance in a local newspaper industry over 125 years in relation to its task and institutional environments. The findings showed that institutional variables were related more to founding patterns, whereas task environment was related more to organizational performance. Hannan studied labor unions in the United States from 1835 to 1985, arguing that ecological and institutional approaches to the study of organizations were complementary. He proposed a model in which both institutional and competitive forces depended on density and in which the legitimacy of an organizational form increased with density. It appears that at low levels of

density legitimation produces a positive relationship between density and founding rates, a prediction that Hannan's data supported. Further, at low density levels, the effects of density on foundings in part incorporate institutional processes of legitimation.

The Interaction of Institutional and Ecological Dynamics

In an effort to disentangle the relationship between the ecological and institutional arguments underlying organizational founding, Tucker, Singh, Meinhard, and House (1988) empirically investigated the relative significances of foundings, disbandings, density, and major changes in institutional environments in explaining founding patterns in a population of voluntary social service organizations located in Canada. The specific aspect of the institutional environment that was of interest was the role played by governments, particularly through their various policies and programs. Results showed that both ecological and institutional variables influenced foundings significantly and suggested a complementarity between ecological and institutional arguments. More important, interaction effects were also significant: major changes in the institutional environment altered the ecological dynamics in this population.

Building on the research of Carroll and Huo (1986), Hannan and Freeman (1987), and Tucker, Singh, Meinhard, and House (1988), in the present study we asked if the ecological and institutional processes that operated within this population of voluntary social service organizations varied significantly by organizational form. To our knowledge, no previous research has addressed this question, for although Hannan and Freeman (1987) presented results for foundings of craft and industrial labor unions separately, their emphasis was on competition between the two forms.

The specific aspect of organizational form that we examined here was the distinction between specialist and generalist organizations, a distinction ecological researchers have considered important (Freeman & Hannan, 1983; Hannan & Freeman, 1977). Specialists and generalists deal differently with their environments. Specialist organizations have characteristics specialized to suit specific environmental features, and generalist organizations have features adapted to a broad range of environmental conditions. Specialist organizations exploit their specific environments to the maximum by being fitted to them but risk having their environments change suddenly. Generalists settle for a relatively low level of exploitation of any specific environmental aspect but have a lower level of risk. One important aspect of this distinction in organizational form is the number of different domains in which organizations operate: specialists operate in single domains and have narrow niches; generalists operate in multiple domains and have broad niches. This difference in organizational form is also clearly related to the extent of an organization's diversification.

Furthermore, specialists deal with narrower, less complex environments than generalists and presumably have simpler organization structures (Burns & Stalker, 1961; Lawrence & Lorsch, 1967). Hence, they need

less diverse talents and skills and require less organizational effort to create. Thus, it is more likely that the creation of specialist organizations will be opportunistically motivated and, therefore, more influenced by both ecological and institutional dynamics as entrepreneurs move quickly to seize new opportunities. Because generalists are more complex internally than specialists, operate in wider environmental domains, and require more effort and talent to found, opportunism will not as easily motivate the founding of generalist organizations, and ecological and institutional dynamics will have less influence on such foundings.

Our central hypothesis in this study was that, given the differences between the environments and internal designs of specialists and generalists, the influence of both ecological dynamics and institutional environmental changes will be stronger for specialist foundings than for generalist foundings. Further, the effects of all variables were hypothesized to operate with a one-period time lag, since instantaneous effects were unlikely. This key theoretical premise translates into the following hypotheses about ecological dynamics, institutional changes, and their interactions:

> *Hypothesis 1: Lagged organizational foundings and disbandings will have stronger curvilinear effects on foundings for specialists than for generalists.*

> *Hypothesis 2: Lagged density will have stronger curvilinear effects on foundings for specialists than for generalists.*

> *Hypothesis 3: Lagged institutional environmental changes will have stronger effects on foundings for specialists than for generalists.*

> *Hypothesis 4: Lagged institutional changes and density will have stronger nonlinear interaction effects on foundings for specialists than for generalists.*

> *Hypothesis 5: Lagged organizational foundings and disbandings and institutional changes will have stronger nonlinear interaction effects on foundings for specialists than for generalists.*

RESEARCH METHODS

Methodological Complexities in Studying Organizational Foundings

As Delacroix and Carroll (1983) suggested, one reason research on organizational foundings has been scarce until very recently is that assessing the phenomenon poses conceptual and methodological difficulties. Establishing the meaning of the concept of founding involves four significant complications. The first concerns the difficulty of determining the specific time at which founding actually takes place. As Sarason (1976: 80) noted, the creation of an organization is not a discrete event but a process, and it is

difficult to determine when informal group activity stops and formal organizational activity begins. Researchers choose points in time at which they deem organizations founded, and those choices are subject to other practical considerations, including data availability. A second complication of the concept of founding concerns organizational mergers and transformations. When two organizations integrate their structures and operations, should the resulting entity be treated as a totally new organization, or should it be said that one of the organizations involved has died? Or, for example, if an existing organization sustains a sudden and large increase in size, a complete turnover of top management, and a name change, have a simultaneous death and founding occurred, or has an organizational change occurred?[1] We treated organizational transformations like name changes and diversification into new service domains as changes rather than foundings. We had both archival and interview data for all organizations, so we were able to investigate such occurrences thoroughly and to understand clearly the exact nature of the transformations.

The third difficulty involves the problem of "distinguishing between all organizing attempts (whether they result in an organization or not) and the subset of organizing attempts that succeed in establishing an operating organization" (Delacroix & Carroll, 1983: 276). The literature on voluntary action and associations is replete with arguments suggesting that organizing attempts are much more frequent than the number of formal foundings suggests. Following Delacroix and Carroll, we chose not to treat organizing attempts as foundings, even though selection pressures must operate on organizing attempts, partly because it is difficult to decide when an organizing attempt actually begins and partly because systematic data on such attempts are very difficult to gather.

A final difficulty in studying foundings concerns level of analysis. As Delacroix and Carroll (1983) and Hannan and Freeman (1987) suggested, researchers cannot treat organizations as units of analysis and must instead think of populations themselves as the units. However, Delacroix and Carroll also wrote that in the study of foundings, "since there is no organization prior to founding, organizational attributes cannot be used as independent variables" (1983: 275). Our position in this study is somewhat different and is closer to that of Hannan and Freeman (1987). We suggest that the differential impact of selection processes operating across different organizational forms at founding significantly influences organizational populations, although this impact manifests itself in different ways than does selection through differential mortality. Thus, if the founding patterns of organizations with different forms systematically differ, organizational forms have differential patterns of entry into the population under study. Not only are

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[1] The issue of mergers did not feature significantly in the relevant population; during the period of observation, there were only five, none which involved the creation, in either name or function, of a new operating entity.

organizations with different forms subject to different fates once created, some organizational forms are much less likely to be founded at all, given prevailing ecological and institutional conditions.[2]

Population

The population studied here included the 451 voluntary social service organizations that came into existence in the metropolitan Toronto area during the period 1970–82.[3] We began by compiling a list of all the distinct voluntary organizations that were born in the area during 1970–82, using federal, provincial, municipal, United Way, and Community Information Centre archives and the annual reports of individual organizations. We then compared this list with the *Provincial Index of Incorporated Nonshare Organizations* and eliminated all organizations without incorporation numbers from the population. This process left 681 organizations. We then reviewed the archival data to determine if each organization on the list was an independent operating unit that conformed to our definition of a voluntary social service organization. Such organizations had to be "instrumental organizations concerned with changing, constraining, and/or supporting human behavior for clients residing within the geographic boundary of metropolitan Toronto" (Singh, Tucker, & House, 1986: 175) The second elimination resulted in a final population of 451 organizations.

Our population was quite diverse, ranging from organizations with only volunteer staffs to sophisticated organizations using advanced information-processing technology and employing professionals. An example of the first type was a neighborhood service center in an ethnic area, at which volunteers provided newly arrived immigrants with settlement and interpretation services. An example of the second type was a multiservice agency providing highly specialized legal, medical, and counseling services through a professional staff. Other organizations studied offered consumer referrals, sociorehabilitative counseling, and cultural and recreational services, to name a few possibilities (Singh, Tucker, & House, 1986: 175).

Data Collection

The mainly archival data for this research were gathered from secondary sources, including files, documents, and indexes from federal, provincial, and municipal governments; files, lists, and documents from local planning, coordinating, and funding agencies; and annual reports of individual vol-

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[2] It is important to emphasize that we deal here with one stage, the moment of founding, of a more general selection process operating on organizing attempts. It is of course difficult to study the selection processes operating on organizing attempts since formal incorporations usually understate their frequency. We did not address this question here.

[3] We studied more organizations here than in our earlier articles on disbanding rates (Singh, House, & Tucker, 1986; Singh, Tucker, & House, 1986). Previously, we restricted our attention to the 389 organizations founded during 1970–80 because updated disbanding data were not available for organizations founded during 1981–82.

untary social service organizations. Trained interviewers also conducted structured interviews with the chief operating officers in 270 of the voluntary social service organizations studied. Interviewers gathered primary data through administering a questionnaire and tried to corroborate the archival data on organizational foundings, disbandings, and forms.

Research Design and Measurements

Design. A time series design was used to analyze the founding patterns of specialist and generalist voluntary social service organizations separately. As the dependent variable was the number of organizations founded in our population in each quarter between January 1970 and December 1982, we had 52 periods of data on specialist and generalist foundings.[4]

Foundings. We defined organizational founding as the formal incorporation date of an organization because we saw incorporation as a clear signal from an organization's founders that they planned to maintain it as an ongoing entity. The frequency of foundings, the dependent variable in this study, was the number of voluntary social service organizations founded every quarter during the period between January 1970 and December 1982.

Disbandings. An organization was defined as disbanded when it ceased to exist as a legal entity. Thus, mergers counted as organizational disbandings.[5] The frequency of disbandings was the quarterly number of disbandings in the population from January 1970 to December 1982. We obtained disbandings data from the *Provincial Index of Incorporated Non-Share Corporations*. Organizations not listed on this index were legally dead. Since only annual disbanding data were available, we were forced to prorate disbandings by quarters.

Density. Density was defined as the total number of organizations alive at a given time in the population. It is useful to bear in mind the relationship expressed by the following:

$$density_t = density_{t-1} + (foundings_{t-1} - disbandings_{t-1}).$$

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[4] We were unable to carry out rate analyses based on interarrival time data like Hannan and Freeman's because we did not have the exact time of founding for each organization. Hannan and Freeman (1987: 926) had exact founding dates down to month and day for about half their cases and randomly allocated a day and month when they had only a year of founding. In contrast, the best data available to us were for month of founding. However, this was not an unduly serious problem since the information captured by arrival rates and founding frequencies is intuitively equivalent, with low arrival rates corresponding to low founding frequencies per unit time, and vice versa.

[5] Of the five mergers that occurred, three were between quasi generalists and organizations founded prior to 1970, which were not part of the study population. We therefore excluded these three mergers from the analysis. Two other mergers were coded as organizational disbandings because they released resources in a manner partly similar to release through disbanding. Two important resources for Toronto-area voluntary social service organizations are their board of directors and listing in the Community Directory of Metropolitan Toronto (Singh, Tucker, & House, 1986). In both, subsequent to the mergers, most of the members did not retain their positions on the new board, and one of the organizations lost its community directory listing.

Form. Voluntary social service organizations differ from each other in terms of the number of domains in which they provide services. About 48 percent of the organizations studied offered services in a single domain, about 33 percent offered services in two domains, and about 19 percent operated in three or more domains. To provide clear comparisons, we designated organizations that operated in a single domain as specialists and those that operated in three or more domains as generalists.[6] Thus, this study did not include organizations that operated in two domains, which we termed "quasi generalists." Although that exclusion effectively deleted some information, we gained a sharp contrast by comparing the pure specialists and pure generalists. Trained coders using archival data on services provided classified the organizations. We corroborated the classifications by using information from other independent archival sources and from the questionnaire, which asked respondents to indicate from a listing of various domains whether they offered services in one or more of them. The coding into the specialist and generalist categories only involved counting the number of domains in which an organization offered services.

Although the distinction between specialists and generalists may be primarily based on size, we think that argument is not fully valid here for two reasons. (1) We investigated whether specialist and generalist organizations differed by size at birth. We used the number of members on an organization's board as a size measure since it is difficult to get meaningful estimates of the number of voluntary organizations' employees, and board members do most of the work in such organizations, at least in the beginning. The mean board size of the specialists at founding was 7.6 members, and that of the generalists was 8.6; the difference was insignificant ($t = 1.28$). (2) In another study, we estimated the impact of form at birth on the death rates of voluntary social service organizations. Controlling for board size at birth, we found that generalists had lower death rates than specialists (Tucker, Singh, & Meinhard, 1988), so form had effects over and above size.

Institutional changes. In the context of effects on this population, two major institutional changes occurred during the period of observation (Tucker, Singh, Meinhard, & House, 1988).[7] From 1971 to 1975, termed the Opportunities for Youth period by the Federal government, the creation of new voluntary social service organizations was legitimated in Canada and

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[6] Freeman and Hannan (1983), who argued that organizational forms are specific blueprints for organizational action, tended to treat form and strategy as interchangeable concepts, and their specialism-generalism measure taps both concepts. We feel that it is useful to treat the concepts separately and distinguish between form and strategy in empirical studies. Just as forms are blueprints, strategies are blueprints as well, but at a higher level of abstraction (Carroll, 1984: 79). However, in general, organizational form may not be tightly coupled with organizational strategy. In this study, we focused more on the concept of strategy, and an important aspect of strategy is the number of different domains in which an organization provides services.

[7] A richer description of the events in the institutional environment leading to these institutional changes appears in Tucker, Singh, Meinhard, and House (1988).

socially accepted as the preferred way to deal with social problems (Best, 1974; Looney, 1977; Huston, 1972; Wharf & Carter, 1972). The onset of Opportunities for Youth constituted a major institutional change in the environment of voluntary social service organizations, both by enhancing their legitimacy and by creating new resources, directly supplied by the government. But over time, institutional conditions changed again; economic issues took precedence over social ones, and both the federal and provincial governments initiated actions that undermined local community groups' efforts to seek organizational solutions to social problems. From 1976 to 1981, the Provincial Restraint period, fiscal restraint was the watchword (McKeough, 1975, 1976; Miller, 1980; Puckett & Tucker, 1976). More emphasis was placed during this period on improving the productivity of existing organizations than on creating new ones (Economic Council of Canada, 1976, 1977).

To reflect these patterns of major institutional change, we used dummy variables to represent both the Opportunities for Youth and Provincial Restraint periods, with 1 indicating their existence and 0 otherwise.

RESULTS

Data Description

Figure 1 shows the quarterly number of total foundings in the population studied. As our theoretical discussion suggested, the data reveal a cyclical pattern of foundings. However, the overall trend was an increase in

FIGURE 1
Quarterly Foundings of Voluntary Social Service Organizations, 1970–82

Years
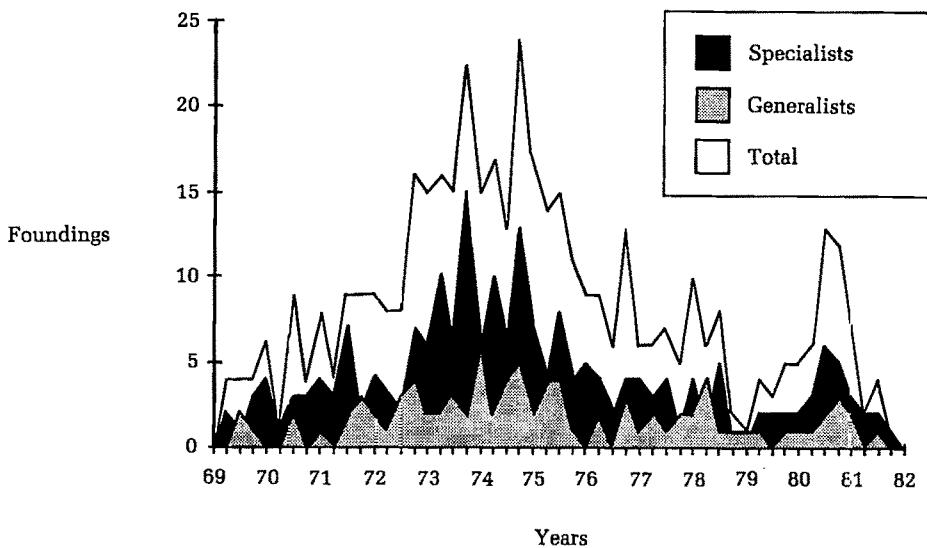
foundings after 1970, with a high in 1975. The subsequent trend was a decline, broken by a surge of foundings in 1981 and 1982.

Figure 1 also shows specialist and generalist foundings. Broadly speaking, except for a difference in the mean levels of specialist and generalist foundings—expected since there were many more specialists than generalists in this population—the overall founding patterns of the two forms were similar. One difference was that the specialist foundings peaked in 1975, whereas the generalist foundings peaked in 1974.

Figure 2 shows annual numbers of disbandings. No disbandings occurred during 1971–72, but the number of disbandings increased thereafter, reaching a high in 1976–77. Subsequently, with the exception of a sharp drop in 1978, the number of disbandings declined monotonically.

Finally, Figure 3 presents quarterly density data. An initially accelerating growth rate later decreased as the size of the population began to stabilize.

One interesting aspect of the foundings data was that the overall peaks for total, specialist, and generalist foundings all roughly coincided with 1975, the last year of the Opportunities for Youth period. The other surge of foundings, in 1981, roughly coincided with the cessation of the Provincial Restraint period. The peak for disbandings, on the other hand, was in 1976, the first year of the Provincial Restraint period. However, although a descriptive look at the overall founding patterns suggests that those institutional changes had significant effects, we cannot, of course, determine at this stage if there are significant ecological dynamics effects, or if the effects of

FIGURE 2
Annual Disbandings of Voluntary Social Service Organizations, 1970–82

Years
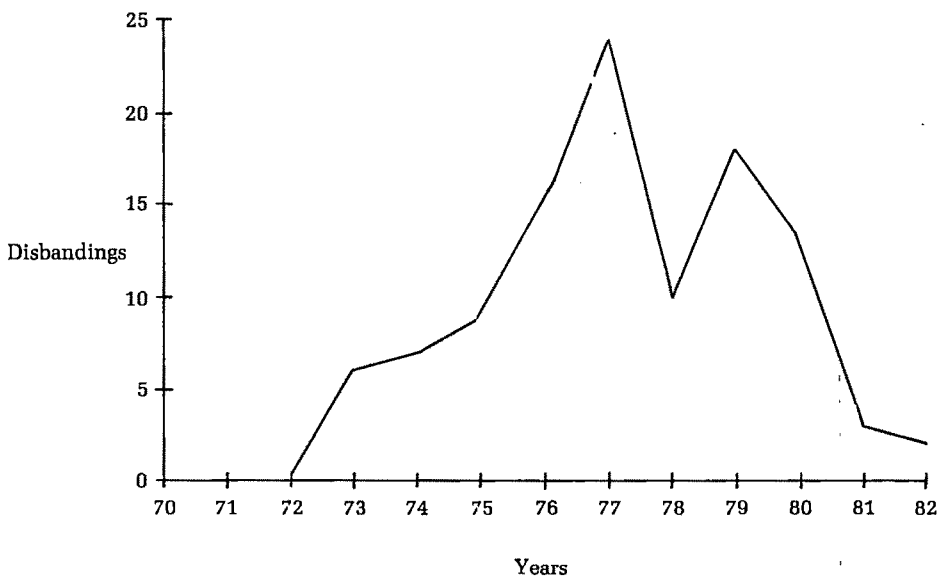
FIGURE 3

Quarterly Density of Voluntary Social Service Organizations, 1970–82
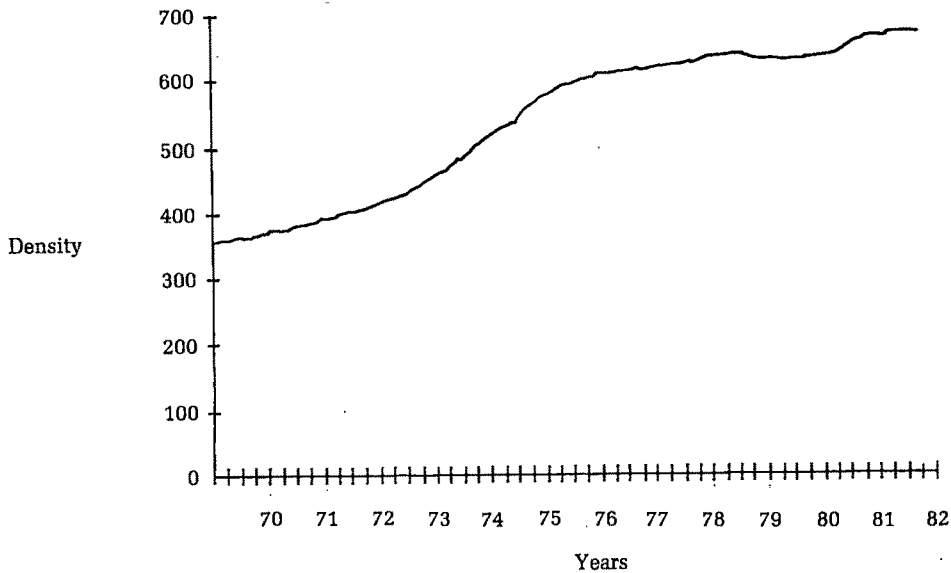
institutional changes persist after the ecological dynamics underlying the founding patterns have been accounted for.

Table 1 shows means, standard deviations, and intercorrelations for the independent variables.[8] Although the two variables measuring institutional change (Opportunities for Youth and Provincial Restraint) are not highly correlated, there are high correlations between foundings and foundings squared and density and density squared, since each quadratic term is a monotonic function of the variable itself. This characteristic introduces significant multicollinearity, which is not an easy problem to deal with. Methodologists have argued that a modest level of multicollinearity is not a serious problem since it will not bias regression estimates, even though their standard errors become large, causing understatement of the significance of the estimated coefficients (Johnston, 1972; Kennedy, 1985; Kmenta, 1971). But even when estimates are unbiased (accurate in an expectational sense), high levels of multicollinearity can alter estimates in magnitude and sign (Srinivasan, 1988). It seems likely that other studies of this genre may have also had problems of multicollinearity (Carroll & Huo, 1986; Delacroix & Carroll, 1983; Hannan & Freeman, 1987; Tucker, Singh, Meinhard, & House, 1988), indicating the importance of dealing with them here. We dealt with multicollinearity by testing the significance of groups of coefficients through comparing nested regression models.

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[8] Following a suggestion from an anonymous reviewer, we also ran the correlations for specialist and generalist organizations separately. These data are available from the first author.

TABLE 1
Correlations, Means, and Standard Deviations for Independent Variables[a]

Variables[b]	Means	s.d.	1	2	3	4	5	6	7
1. Foundings	8.73	5.42							
2. Foundings squared	104.88	121.02	.95						
3. Disbandings	2.08	1.86	.09	.06					
4. Disbandings squared	7.70	10.35	−.04	−.08	.94				
5. Opportunities for Youth	0.33	0.48	.49	.47	−.35	−.38			
6. Provincial Restraint	0.31	0.47	−.17	−.21	.76	.74	−.48		
7. Density	521.33	130.52	.08	.02	.61	.48	−.41	.50	
8. Density squared	288,490	117,130	−.02	−.05	.63	.51	−.53	.54	.96

[a] $N = 51$.

[b] All variables were lagged one time period.

Modeling Requirements

To investigate our main thesis of differential founding patterns for specialist and generalist voluntary social service organizations empirically, we regressed the time series of specialist and generalist foundings separately on independent variables based on our arguments concerning ecological dynamics and institutional change. We computed values that were lagged one time period for all the independent variables since it seemed unlikely that their effects would be instantaneous. The regression equations were of the following general form:

$$SPEC_t = \beta_1 + \beta_2 F_{t-1} + \beta_3 F^2_{t-1} + \beta_4 D_{t-1} + \beta_5 D^2_{t-1} + \beta_6 N_{t-1} + \beta_7 N^2_{t-1} + \beta_8 OFY_{t-1} + \beta_9 RES_{t-1} + U_t,$$

where
$SPEC_t$ = the number of specialists born in period t,
   F_t = the number of voluntary social service organization foundings in period t,
   D_t = the number of voluntary social service organization disbandings in period t,
   N_t = the number of voluntary social service organizations alive in period t,
 OFY_t = a dummy variable for Opportunities for Youth in period t,
and
 RES_t = a dummy variable for Provincial Restraint in period t.

The equations for generalist organizations were similar in form.

The first step in the parameter estimation process was use of ordinary least squares (OLS) procedures. We analyzed the data using an econometric package, SHAZAM, that is especially appropriate for time series analysis. Since autocorrelation is a frequent problem with time series data (Kennedy, 1985), we checked for the presence of first-order autocorrelation using the Durbin-Watson statistic for the OLS results. If the results showed significant

first-order autocorrelation, we explicitly specified a first-order autoregressive error term and used maximum likelihood methods to estimate both the autocorrelation parameter, ρ, and the regression coefficients, β (Kennedy, 1985: 105). Thus, $U_t = \rho U_{t-1} + \epsilon_t$, where $|\rho| < 1$; and $E(\epsilon_t) = 0$, $E(\epsilon_t \epsilon_s) = 0$ for $s \neq t$, and $E(\epsilon_t \epsilon_s) = \sigma^2$ for $s = t$. Unlike U_t, the autoregressive error term, the error term ϵ_t satisfies the usual OLS assumptions; the expected error value is zero, error covariances are zero, and error variances are σ^2. If ϵ_t is normally distributed, maximum likelihood estimation can be used.

However, through exploratory data analysis, we found that in some cases the residuals from a first-order autocorrelation process were still autocorrelated. Since previous researchers have found that with quarterly data error terms may be autocorrelated with up to a four-period lag (Kennedy, 1985: 105; Wallis, 1972), we modeled higher order autocorrelations as well. Although the results were generally not very different, we chose the order of the autocorrelation process on the basis of the significance of the autocorrelation coefficients, the explained variance, and the minimum sum of squared residuals.

In addition to using maximum likelihood procedures whenever autocorrelation posed significant problems, we had to contend with problems of multicollinearity in the data. Multicollinearity tends to inflate standard errors of estimates, which introduces a conservative bias in tests of significance. Consequently, coefficients whose estimates appear to be insignificant may, in truth, be significant. Instead of relying on the usual tests of significance, we tested coefficients by comparing nested regression models (Kmenta, 1971: 371) using an F-test, a useful procedure in a multicollinear environment (Srinivasan, 1988).[9] In this study, we could not use the common approach to multicollinearity of respecifying the models by removing the offending terms (Kennedy, 1985) and reestimating the coefficients because the theoretical ideas themselves specified curvilinear effects (Delacroix & Carroll, 1983; Hannan & Freeman, 1987).

Findings for Specialists and Generalists

Table 2 presents results for the best-fitting autocorrelation process models for the effects of previous foundings, disbandings, density, and institutional changes on specialist and generalist foundings. For comparison purposes, we also report parallel results for total foundings. The latter appear in fuller detail in Tucker, Singh, Meinhard, and House (1988).

Since multicollinearity complicated our data analyses, we followed a

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[9] If there are two nested regression models, one with Q explanatory models (including the constant term) and the other with K explanatory variables, $Q > K$, then

$$\frac{(R^2_Q - R^2_K)\,(n - Q)}{(1 - R^2_Q)\,(Q - K)} \sim F_{Q-K,\,n-Q},$$

where n is the number of observations, R^2 is the variance explained, and F is the F-ratio. This is also known as the Scheffé test.

three-stage process to test our hypotheses. First, as Table 2 shows, we obtained separate results, with autoregressive error terms, for specialist and generalist foundings. Second, we compared nested regression models in order to test the significance of groups of coefficients; for example, we tested the curvilinear effects of lagged foundings and disbandings or of lagged density. Finally, we carried out Chow tests to test for significant differences between estimated coefficients for the two categories of organizations. Table 2 presents some initial results for Hypotheses 1, 2 and 3, and Table 3 gives the fully specified models for those three hypotheses and for Hypotheses 4 and 5.

In Table 2, columns 1, 4, and 7 present the parameter estimates and standard errors for various models of specialist foundings. Column 1 presents the results of a baseline model with curvilinear effects of lagged foundings and disbandings on current specialist foundings. In the model shown in column 4, we added the curvilinear effects of lagged density; and in the model shown in column 7, we added the effects of lagged institutional environmental changes. All the best-fitting models had first-order autoregressive error terms and overall significance ($p < .01$). In model 1, the only significant effect was a positive coefficient for prior foundings, showing that an imitation effect had occurred; none of the curvilinear effects were significant. In model 2, including density brought additional curvilinear effects for disbanding to significance, although density itself had no significant effects. Given the multicollinearity in the data, we also tested the significance of the curvilinear density effects by comparing these two nested models. The results showed that the addition of density made a marginally significant improvement to the variance explained by the model ($F_{2,44} = 2.702$, $p < .10$). The inclusion of institutional environmental changes (column 7) showed significant effects for lagged foundings and disbandings, although there were no curvilinear effects. However, when we added the lagged variable for the Opportunities for Youth period, specialist foundings significantly increased, and they significantly decreased when we added the lagged variable for Provincial Restraint. As would be expected, a test of the nested models (columns 1 and 7) confirmed this last result ($F_{2,44} = 5.624$, $p < .01$). Thus, for specialist foundings, the results showed strong support for the effects of lagged changes in the institutional environment and support for the linear effects of lagged foundings and disbandings but only weak support for the curvilinear effects of disbandings and density.

Columns 2, 5, and 8 of Table 2 present similar results for parallel models of generalist foundings. As for the specialist foundings, all three best-fitting models had a first-order autoregressive error term and overall significance ($p < .01$). The only significant effects in the baseline model were a positive linear effect of lagged foundings and a negative quadratic effect of lagged disbandings (column 2). The addition of lagged density in the second model altered the results substantially: a significant curvilinear effect of lagged disbandings emerged, but no effects due to lagged foundings appeared. A test of the incremental effects of lagged density comparing the two nested

TABLE 2
Results of Regression Analyses Including All Variables[a]

| Independent Variables[c] | Foundings[b] | | | | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | |
	Specialists	Generalists	Total	Specialists	Generalists	Total	Specialists	Generalists	Total
Constant	0.613	0.305	0.910	0.497	0.030	1.871	0.479	0.244	0.673
	(0.804)	(0.473)	(1.224)	(2.169)	(1.196)	(2.649)	(0.730)	(0.468)	(0.869)
Foundings	0.450†	0.157	0.965*	0.413†	0.129	1.053*	0.350†	0.121	0.829*
	(0.174)	(0.010)	(0.276)	(0.181)	(0.111)	(0.255)	(0.164)	(0.102)	(0.216)
Foundings squared	−0.001	−0.001	−0.004	−0.002	−0.000	−0.011	−0.002	−0.001	−0.005
	(0.008)	(0.005)	(0.013)	(0.008)	(0.005)	(0.011)	(0.007)	(0.005)	(0.010)
Disbandings	0.032	0.291	0.364	0.675	0.469	1.600*	0.559	0.475	1.054†
	(0.398)	(0.247)	(0.601)	(0.482)	(0.318)	(0.632)	(0.410)	(0.276)	(0.486)
Disbandings squared	−0.043	−0.059	−0.114	−0.118	−0.080	−0.268*	−0.062	−0.066	−0.010
	(0.073)	(0.045)	(0.113)	(0.078)	(0.051)	(0.104)	(0.066)	(0.045)	(0.079)
Density				0.007	0.004	0.002			
				(0.010)	(0.006)	(0.014)			
Density squared				−0.000	−0.000	−0.000			
				(0.000)	(0.000)	(0.000)			
Opportunities for Youth							1.579*	0.605	2.146*
							(0.572)	(0.388)	(0.667)
Provincial Restraint							−1.224	−0.397	−2.371†
							(0.810)	(0.538)	(1.027)
Adjusted R^2	0.443	0.296	0.550	0.482	0.284	0.618	0.537	0.312	0.660
F-ratio	10.952**	6.261**	21.250**	8.749**	4.300**	17.013**	10.660**	4.871**	20.014**

[a] Parameter estimates are unstandardized values. Standard errors are in parentheses.
[b] First-order autocorrelations were specified for specialist and generalist foundings. Fourth-order autocorrelations were specified for totals.
[c] Baseline independent variables were lagged one time period.

† $p < .10$
* $p < .05$
** $p < .01$

models (columns 2 and 5) showed no significant effects on generalist foundings ($F_{2,44}$ = 0.601, n.s.). Adding institutional environmental changes to the baseline model (column 8) revealed significant curvilinear effects of lagged disbandings and a significant positive effect of lagged Opportunities for Youth on new foundings. But a test of the incremental effects of lagged institutional changes (columns 2 and 8) showed no significant effects on generalist foundings ($F_{2,44}$ = 1.701, n.s.). Thus, the results did not show that lagged density or institutional changes affected generalist foundings, although lagged disbandings had significant curvilinear effects.

Finally, for comparison, columns 3, 6, and 9 of Table 2 report the results for corresponding models for total foundings. These findings resemble the results for the specialist foundings more than those for the generalist foundings. Tests of the relevant nested models showed significant curvilinear effects of lagged density ($F_{2,44}$ = 5.072, $p < .01$) and lagged institutional environmental changes ($F_{2,44}$ = 8.397, $p < .01$).

Table 2 reports unstandardized parameter estimates. To provide a clearer picture of the relative magnitudes of the effects of ecological dynamics and institutional changes, we also examined the standardized coefficients for the models in Table 2. The results seem to suggest that the ecological dynamics of lagged foundings and disbandings influence the founding patterns of both specialists and generalists more strongly than do lagged density dynamics and institutional changes. The latter were of roughly the same order of magnitude.

Comparing Specialists and Generalists

The next steps in our analysis were to estimate more complex models and to compare the parameter estimates for specialist and generalist foundings statistically. Table 3 presents results for the independent effects of ecological dynamics and institutional environmental changes and their interactions for specialist and generalist foundings.

The multicollinearity problems in the data prevented our using patterns of significance levels to test the hypotheses in this study. We tested for equality of the regression coefficients between specialist and generalist voluntary social service organizations using a version of the Chow test (Dutta, 1975: 172–177; Kennedy, 1985: 87–88; Maddala, 1977: 458–460) because a demonstration of significant differences between coefficients for the models of specialist and generalist foundings would have further strengthened our inferences about support for the hypotheses.[10]

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[10] A test for the equality of regression coefficients in two groups is given by

$$\frac{(RRSS - URSS)/k}{(URSS)/(n_1 + n_2 - 2k)} \sim F k, n_1 - n_2 - 2k,$$

where *RRSS* is the restricted residual sum of squares, *URSS* is the unrestricted residual sum of squares (the sum of the two RSSs), n_1 and n_2 are the respective numbers of observations, and *k* is the number of explanatory variables.

Column 1 of Table 3 reports the results for the curvilinear effects of lagged foundings, disbandings, density, and institutional changes on specialist foundings. As in the analyses represented in Table 2, prior foundings and disbandings had significant effects on specialist foundings, and adding the lagged variable for the Opportunities for Youth period increased foundings, whereas adding the lagged Provincial Restraint variable decreased them significantly. However, the same model for generalist foundings (column 2) showed quite different results. Although the overall model was still significant, the explained variance was much lower, with an adjusted R^2 of 0.286 compared with 0.529 for the specialists, and no coefficient was significant. The multicollinearity problems could account for this difference in results, but our confidence in these findings was strong because we had concluded from the F-tests on nested models that the effects of the density dynamics and institutional environmental changes were not significant for generalist foundings. Finally, the results of a Chow test for differences in the regression coefficients for the two models did not support the null hypothesis of equality of coefficients ($F_{9,86} = 3.575$, $p < .01$). Thus, the combined findings weakly support Hypothesis 1 because the effects we found are linear rather than curvilinear for specialists, and they weakly support Hypothesis 2 because the density dynamics are only marginally significant. However, these combined results support Hypothesis 3 strongly.

Institutional Change and Ecological Dynamics

Hypotheses 4 and 5, which concern the interactions of institutional changes and the curvilinear effects of foundings, disbandings, and density, were investigated next. Because of the multicollinearity, we modeled these interaction effects in three sets. Table 3 presents results for the interaction of the lagged variables for the existence of the Opportunities for Youth and Provincial Restraint periods with the other variables. Columns 3 and 4 show the interaction of both periods with the curvilinear effects of lagged density; columns 5 and 6, the interaction of lagged Opportunities for Youth with the curvilinear effects of lagged foundings and disbandings; and columns 7 and 8, the interaction of lagged Provincial Restraint and the curvilinear effects of lagged foundings and disbandings.

The models of specialist and generalist foundings represented in columns 3 and 4 showed marked differences. For specialist foundings, the overall model was significant (adjusted $R^2 = 0.584$, $p < .01$), but for generalist foundings it was not (adjusted $R^2 = 0.216$, n.s.). However, lagged Opportunities for Youth and its interaction effects with the density dynamics were significant for specialist foundings. The serious multicollinearity between the interaction terms obviously caused the anomalous negative effect of Opportunities for Youth: the correlations of Opportunities for Youth interacting with density with Opportunities for Youth times lagged density squared and of Provincial Restraint interacting with density with Provincial Restraint times lagged density squared are both above 0.9. These coefficients need to be interpreted with extreme caution since their precise values are

TABLE 3
Results of Regression Analyses for All Variables and Interactions[a]

Independent Variables[b]	Foundings							
	Model 1		Model 2		Model 3		Model 4	
	Specialists[c]	Generalists[c]	Specialists[d]	Generalists[e]	Specialists[c]	Generalists[f]	Specialists[c]	Generalists[d]
Constant	-1.110 (2.092)	0.129 (1.201)	0.931 (1.778)	-0.374 (1.253)	0.732 (0.875)	0.531 (0.569)	0.423 (0.958)	-0.369 (0.418)
Foundings	0.385** (0.188)	0.117 (0.113)			0.460* (0.252)	0.032 (0.162)	0.469* (0.218)	0.299** (0.100)
Foundings squared	-0.004 (0.008)	-0.000 (0.005)			-0.010 (0.015)	0.006 (0.009)	-0.005 (0.009)	-0.004 (0.004)
Disbandings	0.880* (0.503)	0.511 (0.344)			-0.218 (0.376)	0.272 (0.256)	1.364 (1.061)	-0.108 (0.443)
Disbandings squared	-0.103 (0.075)	0.071 (0.052)			0.023 (0.066)	-0.044 (0.045)	-0.368 (0.315)	0.067 (0.135)
Density	-0.000 (0.011)	0.001 (0.006)	0.009 (0.000)	-0.006 (0.000)				
Density squared	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)				
Opportunities for Youth	1.197* (0.698)	0.543 (0.483)	-95.524** (35.954)	-41.448 (29.637)	-0.196 (2.461)	1.037 (1.598)		
Provincial Restraint	-1.290* (0.814)	-0.408 (0.554)	-429.970 (839.160)	-578.800 (585.240)			0.495 (6.884)	4.594 (3.609)
Opportunities for Youth × density			0.392** (0.159)	0.176 (0.131)				
Opportunities for Youth × density squared			-0.000* (0.000)	-0.000 (0.000)				

TABLE 3 (continued)

Independent Variables[b]	Foundings							
	Model 1		Model 2		Model 3		Model 4	
	Specialists[c]	Generalists[c]	Specialists[d]	Generalists[e]	Specialists[c]	Generalists[f]	Specialists[c]	Generalists[d]
Provincial Restraint × density			1.482 (2.724)	1.876 (1.905)				
Provincial Restraint × density squared			-0.001 (0.002)	-0.002 (0.002)				
Opportunities for Youth × foundings					0.059 (0.494)	-0.039 (0.319)		
Opportunities for Youth × foundings squared					-0.002 (0.021)	-0.005 (0.014)		
Opportunities for Youth × disbandings					0.867 (1.757)	0.240 (1.213)		
Opportunities for Youth × disbandings squared					-0.395 (0.797)	0.267 (0.557)		
Provincial Restraint × foundings							-0.028 (0.567)	0.072 (0.334)
Provincial Restraint × foundings squared							-0.001 (0.035)	-0.020 (0.021)
Provincial Restraint × disbandings							-1.844 (3.099)	-1.705 (1.468)
Provincial Restraint × disbandings squared							0.427 (0.463)	0.123 (0.209)
Adjusted R^2	0.529	0.286	0.584	0.216	0.584	0.330	0.442	0.408
F-ratio	8.007**	3.500*	9.797**	2.721	8.740**	3.740*	5.370**	4.991**

[a] Standard errors in parentheses.
[b] All independent variables were lagged one time period.
[c] First-order autocorrelation.
[d] Fourth-order autocorrelation.
[e] Ordinary least squares.
[f] Second-order autocorrelation.
* $p < .05$, one-tailed test
** $p < .01$, one-tailed test

most likely misstated. However, it was still possible to test whether all the interaction terms together added significantly to the model by comparing it with another model containing none of the problematic interaction terms. This test showed that the deleted interactions added significantly to the model for specialist foundings ($F_{4,42} = 4.075$, $p < .01$). Thus, even though it is not possible to comment reliably on the signs of the curvilinear interactions between institutional changes and density, we can confidently say that the occurrence of the Opportunities for Youth and Provincial Restraint periods significantly altered the density dynamics. The same test applied to generalist foundings showed that the interaction terms did not contribute significantly to the model ($F_{4,42} = 1.72$, n.s.). Finally, a Chow test showed that the coefficients for the two models differed significantly ($F_{9,81} = 3.501$, $p < .01$). These findings supported Hypothesis 4.

Of the coefficients that appear in columns 5 and 6 in Table 3, only the one showing the effect of lagged foundings on specialist foundings was significant. However, the curvilinear interaction effects of lagged Opportunities for Youth with foundings and disbandings were significant for specialists ($F_{4,41} = 2.617$, $p < .05$) but not for generalists. A test for equality of coefficients showed that they were significantly different ($F_{10,84} = 3.878$, $p < .01$). As before, the explained variance was much higher for the overall model for specialist foundings (adjusted $R^2 = 0.584$, $p < .01$) than for the generalist model (adjusted $R^2 = 0.330$, $p < .05$). These results supported Hypothesis 5 for the effects of the Opportunities for Youth period.

The results for the effects of the Provincial Restraint period were not as supportive of Hypothesis 5. The results shown in columns 7 and 8 were both significant overall ($p < .01$). The interaction terms taken together (Provincial Restraint × foundings, Provincial Restraint × foundings squared, Provincial Restraint × disbandings, and Provincial Restraint × disbandings squared) did not contribute significantly to levels of specialist foundings but did have a significant effect on levels of generalist foundings ($F_{4,41} = 3.27$, $p < .05$). The results for the test of equality of coefficients showed only marginally significant differences ($F_{10,84} = 1.667$, $p < 10$). Thus, findings did not support Hypothesis 5 for the effects of the Provincial Restraint period.

DISCUSSION

The overall results of this study showed that the founding patterns of specialist and generalist voluntary social service organizations appear to be significantly different. Whereas the curvilinear effects of lagged foundings, disbandings, and density and the effects of changes in the institutional environment are significant for specialist foundings, they are not significant for generalist foundings. Further, lagged institutional changes and density have significant nonlinear interaction effects for specialists but not for generalists, although the nonlinear interactions for lagged institutional changes and foundings and disbandings are much weaker, being significant for Opportunities for Youth but not for Provincial Restraint.

The findings of our study generally elaborate and qualify the findings of earlier work in a significant way. For the most part, earlier research has implicitly treated the founding of any organization as equivalent to the founding of any other organization. Thus, investigators implicitly assumed that founding processes did not differ by organizational form. Our results suggest that it may be important to differentiate between organizational forms in studying their founding dynamics. Specifically, our results suggest significant differences between specialist and generalist organizations in the population we studied, with ecological dynamics and institutional changes influencing specialists more than generalists.

This study has some limitations. First, the number of periods (52) for which we had data is not large, especially in view of the complexity of the models estimated. Second, voluntary social service organizations are a rather unique population, given their ambiguous technologies and lack of clear output criteria (Singh, Tucker, & House, 1986: 174). For both these reasons, it would be helpful to study the central questions asked here in the context of other populations to see if these results are generalizable.

It would also be useful to compare the results of our study with those of other studies of organizational foundings. For us, those comparisons proved somewhat difficult since most earlier studies of organizational foundings have focused primarily on the conditions under which organizations proliferate without explicitly distinguishing between different organizational forms.

A major exception was Hannan and Freeman's (1987) study of founding processes in a population of labor unions; even that study primarily emphasized density dependence of foundings rather than differential founding patterns across organizational forms. However, Hannan and Freeman's results may reasonably be interpreted as lending some support to the present findings.

One of Hannan and Freeman's important findings was that the founding patterns of industrial and craft unions differed considerably. For craft union foundings, the density of craft unions had a positive effect and the number of previous foundings of craft unions a curvilinear effect; previous foundings of industrial unions had a positive effect, and the density of those unions a negative effect, showing that there was competition between the craft and industrial unions. But for industrial union foundings, although Hannan and Freeman's most fully specified models showed some evidence of curvilinear effects for the density of industrial unions, previous foundings of industrial unions and the density of craft unions did not affect new foundings. Thus, ecological dynamics affected industrial union foundings less than craft union foundings, and the competition between industrial and craft unions appeared to be asymmetric.

Although the distinction between craft and industrial unions is not identical to the distinction between specialist and generalist organizations, it seems plausible that industrial unions would, ceteris paribus, be more generalized than craft unions, at least with respect to the skills and occupa-

tions of the individuals being organized. Hannan and Freeman (1987: 927–928) pointed out that, in the craft form of organization, workers at a single site are organized into several different unions based on different occupations and skill levels. Industrial unions, on the other hand, ignore differences between occupations and skill levels and seek to organize all production workers at a work site. Viewed in this light, the results of Hannan and Freeman's study generally support our theoretical statement that founding patterns differ by organizational form. This argument implies that independent empirical evidence from two different populations—labor unions and voluntary social service organizations—shows that the founding patterns of organizations differ by organizational form.

It is also appropriate to discuss some of this study's general implications for organizational ecology research. First, whereas earlier work has shown that both ecological dynamics and institutional changes influence organizational foundings and that institutional change can alter ecological dynamics (Tucker, Singh, Meinhard, & House, 1988), this study demonstrated that those findings appear to be generally more true for specialist than for generalist organizations. Additionally, the factors influencing founding patterns are multivariate. Thus, the curvilinear effects of lagged density, foundings, and disbandings operate simultaneously with the effects of lagged institutional changes and sometimes operate in interaction with them.

Second, the selection processes associated with organizational founding are complex. Although, here we examined one stage of the selection processes related to foundings—the moment of founding—it would appear that organizing attempts themselves may be subject to selection pressures. Do our results on the differential founding patterns of organizational forms offer any information about the selection processes occurring prior to founding? If we assume that the yields of specialist and generalist organizing attempts will be roughly comparable in terms of the proportion of actual foundings to attempts, differential founding patterns of different organizational forms do reflect differential selection pressures acting on organizing attempts. In order to study those processes rigorously, of course, we would have to study a population of organizing attempts and examine how specialist and generalist organizing attempts differentially yielded specialist and generalist organizations. Future research would do well to explore this question further.

Third, the results on differential founding patterns need to be seen in conjunction with earlier work on how selection occurs in organizational populations through differential disbanding rates (Carroll & Delacroix, 1982; Freeman & Hannan, 1983; Singh, House, & Tucker, 1986; Singh, Tucker, & House, 1986; Tucker, Singh, & House, 1984). Among other results, those studies found that pressures for disbanding affect organizational forms differentially, with environmental conditions like uncertainty and seasonality and the stage of an organization's life cycle taking a role. It appears that, in general, selection processes operate with differential impact across organizational forms both at founding and disbanding. This conclusion under-

scores the utility of the ecological approach in helping to understand how populations change over time.

Finally, the current findings suggest some preliminary recommendations for potential entrepreneurs. Since previous founding and disbanding patterns influence new foundings, it would be useful for entrepreneurs to examine the evidence on those events for the population they find of specific interest. At low levels, both earlier foundings and disbandings represent opportunities, especially for specialist organizations. Further, after favorable institutional changes, the chances are good for the creation of specialist organizations, and those chances are not good if unfavorable institutional changes have occurred. Thus, historical information on patterns of founding and disbanding in a population and on the relevant institutional environment can help entrepreneurs make informed choices about both when to found an organization and the form the organization should take at founding.

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RESEARCH NOTES

CORRECTING TURNOVER STATISTICS FOR COMPARATIVE ANALYSIS

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Variability in turnover base rates may bias the results of comparative analyses in research on turnover. This article illustrates statistical corrections to turnover correlations based on range restriction formulas. Comparative analysis using corrected statistics seeks to facilitate the process of unbiased comparative inference.

Comparative analysis has become an indispensible tool of the inferential process. For instance, researchers frequently compare the predictor-criterion correlations studies yield to identify the best predictors. Platt characterized comparative tests of competing models as "strong-inference research" (1964). Comparative analysis is widely used in research on turnover, but researchers have frequently overlooked methodological artifacts that may bias the comparative process. This article discusses the effects of turnover base rates on comparative analyses in turnover research.

A base rate for organizational turnover may be expressed as the number of voluntary leavers over the total sample size per a specific unit of time, such as a year. Reviews of the literature on turnover have found that base rates vary dramatically from study to study (e.g., Carsten & Spector, 1987; McEvoy & Cascio, 1987; Steel & Griffeth, 1989). For instance, Steel and Griffeth reviewed 23 studies and found base rates ranging between .06 and .50.

The turnover base rate determines a study's criterion variance. As Figure 1 illustrates, criterion variance increases along a steeply curved gradient

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FIGURE 1
Relationship Between the Turnover Base Rate and Turnover Criterion Variance
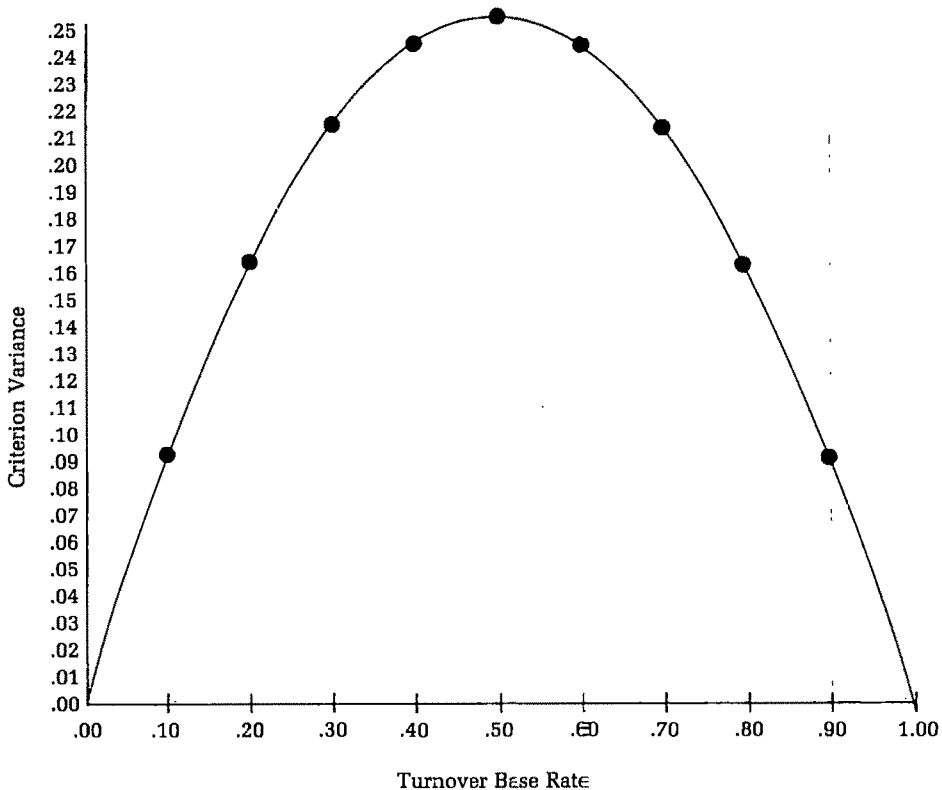
as base rates rise. It reaches a stochastically optimal level when the proportions of leavers and stayers are identical (i.e., .50). Although frequently overlooked, this functional relationship has a profound influence on the outcomes of studies.

Suppose two different studies report correlations of .58 between organizational commitment and turnover. May a reader safely conclude that the correlations are identical estimates of the underlying relationship between the two latent variables, organizational commitment and turnover? That conclusion is warranted if the studies feature comparable base rates, ceteris paribus. But if they do not, the correlations may not be directly comparable. Suppose the two studies have base rates of .06 and .50, respectively. A correlation of .58 from a study with a base rate of .06 signifies a far stronger relationship than a correlation of .58 from a study with a base rate of .50. Although the former relationship corresponds to the maximum feasible correlation, given a base rate of .06 (Thorndike, 1978), the latter statistic repre-

sents a moderate relationship since the absolute limits of point-biserial correlation normally range between .00 and ±.80 (Thorndike, 1978).

The effects of base rates on research outcomes has long been acknowledged (Wiggins, 1973), but turnover researchers have only lately begun to study the effects of base rates on their research results systematically. McEvoy and Cascio's (1987) meta-analysis examined base rates as moderators of relationships between turnover and performance. They found that correlational statistics from studies with high base rates explained four times more variance than results from studies with lower base rates.

Peters and Sheridan (1988) discussed the effects of measurement windows on turnover base rates. They concluded that time lag–base rate confounding was a major source of bias in cross-study comparative analysis.

Steel and Griffeth's (1989) meta-analysis focused on research relating perceived alternatives and turnover. They found that effect-size statistics in these studies were highly correlated with turnover base rates ($r = .60$, $p <$ .01).

These studies illustrate the existence of a functional dependency between research outcomes and turnover base rates. Given this dependency, cross-study comparative analysis that neglects to consider the impact of base rates on study outcomes risks drawing biased conclusions.

STATISTICAL CORRECTIONS

In the field of personnel research, validity generalization studies correct for range restriction resulting from the exclusion of cases from a sample (Hunter, Schmidt, & Jackson, 1982). Although complex motive and market forces like occupational job markets determine levels of true variation in turnover variables (Steel & Griffeth, 1989), the methodological decisions a researcher makes about how to measure a criterion variable frequently result in criterion-variance restriction.

Decisions a researcher makes about the length of the prediction interval normally have a profound impact on a study's base rate (Peters & Sheridan, 1988). Consider, for instance, that over a four-year period Dalton and Todor (1987) found that the percentage of leavers in their sample grew by an average 11 percent each year. Turnover researchers are beginning to realize that seemingly inconsequential decisions about when a study begins and ends have profound implications for key study parameters like the operational definition of turnover (the base rate), sample composition, compatibility with other studies, and so on.

Because turnover base rates have a predictable effect on criterion variance and study outcomes, it is technically feasible to correct study outcomes for artificial variance restriction on the criterion variable. The general formula for performing this correction, adapted from Thorndike's (1949) case II range restriction problem (J. E. Hunter, personal communication, January 27, 1987), is:

$$R_{xy} = \frac{r_{xy} \dfrac{\sigma_y}{\sqrt{pq}}}{\sqrt{1 - r_{xy}^2 + r_{xy}^2 \dfrac{\sigma_y^2}{pq}}} \tag{1}$$

where

R_{xy} = the correlation corrected for variance restriction,

r_{xy} = the observed correlation,

σ_y = the unrestricted standard deviation of the dichotomous variable,

p = the observed proportion of cases in one class of the dichotomous variable,

q = the observed proportion of cases in the other class of the dichotomous variable,

and

σ_y^2 = the unrestricted variance of the dichotomous variable.

If it were possible to estimate the reliability of turnover variables, reliability corrections would achieve the same result as corrections for variance restriction.[1]

In a typical turnover study, r_{xy}, p (the proportion of leavers), and q (the proportion of stayers) represent standard observational statistics. Therefore, the key unknown parameter in Equation 1 is σ_y^2. We will outline two different approaches to estimating this parameter.

One approach involves substituting .25 for σ_y^2 and .50 for σ_y. This approach employs an estimate of the statistically optimal criterion variance as the basis of correction.[2] Statistically optimal variance is a function of distributional properties of dichotomous variables: when $P = Q = .50$, $\sigma^2 = .25$. This approach assigns all correlations a base rate of .50 to eliminate differential base-rate effects on them. The corrected statistics will prove more amenable to cross-study comparative analysis.

Statistics corrected in this fashion may also prove to be useful reference points for gauging the accuracy of inferences about theoretical linkages. Corrected and uncorrected estimates of a given relationship may be compared to construct a best case–worst case conclusion interval around a focal

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[1] We wish to thank an anonymous reviewer for bringing this point to our attention.

[2] Hunter, Schmidt, and Jackson (1982: 99) provided a formula for correcting point-biserial r for imbalance in the sizes of treatment groups. This formula may be used as an alternative to Equation 1, provided a researcher is correcting with reference to the statistically optimal criterion variance (i.e., $\sigma_y^2 = .25$). The formula then is

$$r_c = \frac{r}{4pq(1 - r^2) + r^2},$$

where

r = the observed point-biserial r,

p = the proportion of leavers,

and

q = the proportion of stayers.

latent relationship. The width of a conclusion interval reflects the margin of error associated with inferences about the theoretical relation of interest.

An alternative approach to correction employs a derived normative statistic, or ecological base rate, as the basis for estimates of σ_y^2 and σ_y. To derive an estimate of the ecological base rate, we consulted three recent literature reviews summarizing turnover base-rate statistics (McEvoy & Cascio, 1987; Steel & Griffeth, 1989; Steel, Hendrix, & Balogh, 1989). From these articles we compiled a list of statistically independent studies, their base rates, and sample sizes. We subtracted base rates greater than .50 from 1.00 because base-rate–variance functions peak at .50 and are symmetrical about their midpoints. Our review yielded 73 studies, 84 independent samples, and a population of 91,383 individuals. The average base rate, weighted by sample size, was .21. To derive σ_y^2 for insertion into Equation 1, we multiplied the normative turnover rate ($P = .21$) by the normative retention rate ($Q = .79$). Thus, whenever normative statistics were employed as estimators of the unrestricted variance, $\sigma_y^2 = .1659$ and $\sigma_y = .4073$.

Admittedly, our estimating procedure yields a rather crude estimate of the ecological turnover rate. Nevertheless, this estimate does exemplify trends in the literature on turnover. Any shortcomings it has as a universal parametric estimator largely reflect sampling biases endemic to the contemporary empirical literature.

Intrastudy Comparisons

To this point, our discussion has focused on problems with cross-study comparisons of turnover research. However, intrastudy comparisons are also susceptible to a subtle form of base-rate bias. Many turnover studies seek to compare point-biserial correlations calculated on predictor-criterion relationships with correlations summarizing predictor-predictor relationships. This practice fosters interpretational confusion and inferential bias because these statistics have different properties.

The majority of criterion correlations in the turnover literature are point-biserial correlations (r_{pb}). A point-biserial r systematically underestimates conventional correlation statistics calculated on fully continuous data. Under the most favorable circumstances—when $p = q = .50$ and the continuous variable is normally distributed—the upper bound of r_{pb} is .798 (Thorndike, 1978). Only in rare instances does r_{pb} exceed .798 (i.e., a bimodal continuous variable). As the ratio of leavers to stayers becomes increasingly imbalanced, the correlational ceiling lowers. In extreme cases, when the base rate is very low ($\leq .10$), "the limits of r_{pb} are about $\pm .58$" (Thorndike, 1978: 78).

Therefore, once turnover statistics have been corrected for variance restriction, we suggest a second correction to the correlation statistics. If comparative analysis is intended, the point-biserial r's may be converted to biserial correlation coefficients (r_b), a statistic that approximates the magnitudes of correlations calculated from continuous data. Glass, McGaw, and

Smith (1981) provided a formula for estimating r_b from r_{pb}. The basic formula is

$$r_b = \frac{r_{pb} \sqrt{n_1 n_2}}{uN}$$ (2)

where

r_{pb} = the turnover correlation, corrected for variance restriction,
N = the sample size
u = the ordinate of the unit-normal curve corresponding to some estimator of the population base rate, P (.50 or .21),
$n_1 = (P \times N)$,

and

$n_2 = (N - n_1)$.

A DEMONSTRATION

To demonstrate the application of the corrections we have outlined to theory-based turnover research, we corrected statistics from a widely cited turnover study by Mobley, Horner, and Hollingsworth (1978). This study had a turnover base rate of .10.

Table 1 contains the original statistics Mobley and colleagues (1978) reported and the corrected statistics we calculated. The original r_{pb}'s appear in the first column of the table. The corresponding biserial r's, corrected with reference to the normative turnover rate (.21) and the statistically idealized maximum turnover rate (.50), appear in the second and third columns of the table.

Mobley and colleagues (1978) used multiple regression analysis to estimate the fit between a heuristic model of turnover and their empirical data.

TABLE 1
Original and Corrected Turnover Statistics from Mobley, Horner, and Hollingsworth

				Multiple Regression Statistics		
Predictors	Original r_{pb}	Normative Corrected r_b	Maximum Corrected r_b	Original β	Normative Corrected β	Maximum Corrected β
Intention to quit	.49	.85	.85	.58	.92	.85
Age-tenure	−.27	−.51	−.53	−.10	−.23	−.25
Intention to search	.29	.54	.56	−.13	−.14	−.15
Thinking of quitting	.19	.35	.39	−.06	−.10	−.06
Probability of finding acceptable alternative	.07	.13	.15	−.01	−.01	.01
Overall satisfaction	−.21	−.40	−.42	.01	.00	−.01
Multiple R				.51	.89	.88

We recomputed their regression statistics from correlation matrixes containing corrected predictor-turnover correlations. Table 1 provides original, normative-corrected, and maximum-corrected regression statistics estimating the degree of latent relationship underlying linkages in Mobley and colleagues' model of the turnover process.

As the table illustrates, the high degree of variance restriction characterizing the study adversely affected the magnitude of its statistics. The corrected statistics show that, in fact, the study's results explained a great deal of criterion variance, given the circumstances. This conclusion remained the same regardless of the correction used.

Corrected statistics may aid a researcher in estimating the amount of unrestricted criterion variance explainable by model parameters. However, tests of significance should be performed on the original statistics (Mobley et al., 1978), not the corrected ones. The process of correction does not change inferences about statistical significance.

INTEGRATIVE DISCUSSION

Several potential applications of base-rate corrections discussed herein have relevance to the types of problems facing researchers doing comparative analyses on turnover. We will use the original statistics from Mobley and colleagues (1978) and our corrected statistics (Table 1) to illustrate some alternative applications.

When empirical findings are compared across a series of studies with varying base rates, base-rate variance constitutes a source of methodological variation confounding the analysis (Hulin, 1984). Meta-analytic effect-size estimates will appear to fluctuate from study to study, and estimates of the variance in the correlational distribution will be grossly inflated. Performing a standard correction to all turnover correlations prior to meta-analysis permits more accurate estimation of the true cross-study variation characterizing a particular type of turnover relationship.

It may also prove helpful to compare observed statistics with corrected statistics in order to construct a conclusion interval around a focal latent relationship. For instance, Table 1 suggests that the latent relationship between satisfaction and turnover lies somewhere between the lower bound of $-.21$, as defined by Mobley and colleagues' observed statistic, and an upper bound of $-.42$, as defined by the maximum correction. The width of the conclusion interval permits gauging of the margin of error associated with an inference about a theoretical relationship.

A third possible application of base-rate correction involves correcting observed statistics with reference to some estimate of the normative, or ecological, base rate. This correction aids theoretically grounded research endeavoring to compare predictor-predictor correlations based on two continuous measures to predictor-turnover correlations (r_{pb}'s). For instance, Mobley and colleagues reported correlations of .72 between variables measuring the intention to search and the intention to quit, and .49 between the inten-

tion to quit and turnover. Both correlations correspond to linkages between adjacent components of their turnover model. Comparative analysis of the raw statistics would suggest that the intention-intention linkage was much stronger than the intention-turnover linkage. However, the normative-corrected biserial r shown in Table 1 for the link between the intention to quit and turnover was .85. This statistic would suggest that the degree of relationship characterizing the two linkages was similar. Furthermore, measurement error still remains as an uncorrected source of bias.

In some instances the corrections we performed on Mobley and colleagues' (1978) correlations produced dramatic differences in estimates of the magnitude of ρ. However, the corrected statistics reported in the present study are consistent with other empirical findings in the turnover literature. While performing a test of Mobley and colleagues' turnover model, Miller, Katerburg, and Hulin (1979) replicated many of the relationships summarized in Table 1. However, the Miller study had a turnover base rate of .50. It is informative to compare the maximum corrected correlations shown in Table 1 with the following correlations reported by Miller and colleagues: intention to quit, r = .71; probability of finding acceptable alternative, r = .16; overall satisfaction, r = −.38. It should be remembered that Miller and colleagues' correlations were point-biserial r's. Consequently, the upper limit of their predictor-criterion correlations was probably .80. Evidently, the substantial differences between the two studies in terms of their findings is largely a by-product of their differing base rates.

The increasing reliance of turnover researchers on techniques of comparative analysis reflects the discipline's maturation as a field of study. The corrections illustrated in this article may prove helpful in solving a variety of comparative problems. By reporting observed and corrected statistics, primary researchers may better evaluate the explanatory potential of model parameters. Furthermore, meta-analyses of turnover research may find that estimates of cross-study variance decline sharply once variance restriction attributable to methodological factors is taken into account.

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REWARD ALLOCATIONS IN THE UNITED STATES, JAPAN, AND KOREA A COMPARISON OF INDIVIDUALISTIC AND COLLECTIVISTIC CULTURES

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This study replicated earlier work comparing reward allocation preferences across countries. Results obtained from student groups from the United States, Japan, and South Korea supported the earlier findings. Most noteworthy was a strong universal reward allocation pattern that approximated the equity norm, according to which, rewards are distributed to group members based on their contributions. However, the groups from the United States and Japan, countries that previous research on culture has identified as respectively very individualistic and very masculine, exhibited a stronger preference for equity than the group from South Korea, a country that earlier data have shown to be neither individualistic nor masculine.

The concept of equity (Adams, 1965) as a reward distribution rule stipulates that rewards be allocated to group members according to their contributive inputs. Equity is probably the most widely accepted reward allocation rule, but it is only one of several principles of distributive justice. Research has suggested that the situation determines which reward allocation rule—equity, equality, or need—is likely to be used (Deutsch, 1975, 1985). The equity rule tends to prevail when a group's primary goal is economic performance and the group is not concerned with group harmony; the equality rule tends to be salient when a group is primarily concerned with assuring interpersonal harmony and preventing conflicts. Finally, the need rule is often invoked when personal welfare and individual development are a group's main goals.

In applying these findings to a cross-cultural setting, Bond, Leung, and Wan (1982) compared the pattern of reward allocation in groups in the United States and Hong Kong. They posited that the reward groups give their members is based upon the members' contributions to the group. The researchers conceptualized two kinds of group-member contributions: task inputs and maintenance inputs. Task inputs are member contributions that

are directly tied to accomplishing a group's task goals, and maintenance inputs are those that provide socioemotional support and help maintain group cohesiveness.

Using college students from the two countries as subjects, Bond and colleagues found that although both groups exhibited an equitable reward allocation pattern, the degree of equity in the allocations varied. The Hong Kong group preferred a less equitable, more equal, allocation pattern than the U.S. group for both task and maintenance inputs. These researchers sought an explanation for their finding in Hofstede's (1980, 1983) measure of the individualism-collectivism dimension of culture but did not assess this dimension directly. Hofstede's data identified the United States as the most individualistic of 50 countries, rating it 91 on a scale on which scores ranged from 5 to 91 ($\bar{x} = 44$) and identified Hong Kong as low, with a rating of 25. They concluded that Hong Kong students exercised moderation in applying the equity rule in order to preserve group harmony and cohesiveness.

In countries emphasizing collectivism rather than individualism, group harmony is thought to be an important goal in its own right. Thus, the group from Hong Kong, a country Hofstede's data indicated to be collectivistic, had understandably chosen to be less equitable than the U.S. group in rewarding member task inputs in order not to disrupt group harmony. However, why did the Hong Kong group also show relative moderation in rewarding maintenance inputs, which are assumed to be instrumental for group harmony?

There are two possible explanations. First, in a society like Hong Kong, avoiding differentiation of rewards may be a strong norm. In a group-oriented, tightly knit society, people may consider highly differentiated rewards inherently detrimental to group harmony, even when they are for contributions considered instrumental for group harmony. Second, an unknown chance mechanism may have caused the results. In view of this uncertainty, an effort toward multiple corroboration seemed justified to determine whether Bond and colleagues' findings emerged under different conditions. The purpose of this research was to replicate the earlier study using data from different countries: the United States, Japan, and South Korea.[1]

HYPOTHESES

The two opposite extremes of Hofstede's (1980, 1983) individualism-collectivism dimension respectively reflect the primacy of the individual and the group in social interactions. It then follows that groups in countries Hofstede identified as highly individualistic, where people are expected to rely primarily upon themselves and are not much concerned with groups, would place a greater emphasis on members' task-related contributions than would groups in countries identified as less individualistic. Hofstede's data

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[1] We refer to South Korea as "Korea" from here on in this article.

indicated that the United States was the most individualistic of the 50 countries studied; Japan, which achieved a 46 on his scale, was rated as intermediate for individualism, and Korea, with an 18, was low. Given Hofstede's data, we developed the following hypotheses

> *Hypothesis 1: Task inputs will play a more significant role in reward allocation in U.S. groups than in Japanese and Korean groups.*

> *Hypothesis 2: Task inputs will play a more significant role in reward allocation in Japanese groups than in Korean groups.*

When group members' contributions toward group maintenance are the criterion for the allocation of rewards, however, the direction of prediction would be the opposite. In countries Hofstede identified as highly collectivistic, maintaining group harmony would be more critical than it is in countries identified as less collectivistic. Therefore, viewing maintenance inputs as instrumental for promoting group harmony, we posited that

> *Hypothesis 3: Maintenance inputs will play a more significant role in reward allocation in Korean groups than in Japanese and U.S. groups.*

> *Hypothesis 4: Maintenance inputs will play a more significant role in reward allocation in Japanese groups than in U.S. groups.*

METHODS

Subjects

A total of 389 undergraduate college students—132 American, 117 Japanese, and 140 Korean—were recruited. Because of differences in the three countries' educational systems and difficulties in gaining access to some schools, we did not attempt systematic sampling when selecting the institutions. We included only schools that granted at least baccalaureate degrees and had neither an extremely high nor an extremely low academic reputation. In the United States, we chose subjects at a medium-sized (17,000 students), midwestern, state-supported university with a wide offering of academic disciplines. In Japan, we used four schools: (1) a nationally supported, social-sciences-oriented university with an enrollment of about 4,600, (2) a nationally supported, natural-sciences-oriented university with about 4,500 students, and (3) two private liberal-arts-oriented universities with respective enrollments of 4,700 and 800. In Korea, we used one school, a private university of 16,000 students with a comprehensive academic program.

Within each university, we chose students randomly at such places as dormitories, cafeterias, and libraries and asked them to participate in the study without compensation. Over 95 percent of those asked agreed to participate. The proportions of men participating were respectively 51.8, 48.7, and 57.9 percent for the United States, Japan, and Korea. For the three

countries, mean ages (shown with standard deviations in parentheses) were 20.3 (2.1), 20.0 (1.3), and 20.8 (1.7). Professional fields like business, education, and law were the most popular majors in all three countries (54.5, 54.4, and 48.9%), followed by the humanities, arts, and sciences (23.5, 38.6, and 42.4%).

Independent Variables

Country, task inputs, and maintenance inputs were the study's independent variables. Country, reflecting the nationality of the students, was coded 1, 2, or 3 for Korea, Japan, or the United States. We experimentally manipulated the other two variables using Bond and colleagues' (1982) scenario method, which employs different versions of a one-page scenario. Students received scenarios in their own language; versions were translated from English by the committee method (Brislin, Lonner, & Thorndike, 1973).

The scenario describes a university class in which students are required to form small groups to do a research project, and 50 percent of their grade is based on peer evaluations of group members' contributions to the project. The opening paragraph tells readers they are to evaluate the contributions of an individual called member A. Next, three alternative paragraphs describe member A's task-related contributions as high, intermediate, or low (coded 3, 2, and 1). The paragraph describing high task inputs contains phrases like "constantly made very useful suggestions," "the quality of finished work was excellent," and so forth. Progressively less positive evaluations represent the intermediate and low levels.

Similarly, to establish the high, intermediate, and low levels of maintenance inputs (coded 3, 2, and 1), we varied three paragraphs differing in terms of how friendly, considerate, encouraging, and helpful member A was described as being, and whether he helped to ease or worsen conflicts. Thus, we randomly administered nine different versions of the scenario, constructed from three levels of task inputs and three levels of maintenance inputs.

Two questions might arise regarding the experimental protocol. First, are group projects a common practice in colleges in all three countries? To our knowledge, they are, although they are probably less frequent in Japan and Korea than in the United States. Furthermore, the detailed situation descriptions the scenario provided were likely to ease a possible lack of familiarity with group projects. Second, is working on a group research project in a college class too far removed from a management context to lead to useful data? Since allocation norms that have their basis in national culture are likely to generalize across specific task contexts, we thought the norms applying to the group research projects would be likely to apply to work in organizations as well.

Dependent Variables

The subjects were asked to respond to a modified version of the scale devised by Bond and associates (1982: 193) (see the Appendix). The scale's

items measure either the amount of rewards subjects intend to allocate to member A or the likelihood of their giving rewards. The original scale contains six items, but we used only five for the present study; the unused item asks respondents to report how likely it is they will openly discuss with member A the grades assigned him. We did not use this item because we suspected that two extraneous variables, the degree of favorableness of the assigned grades and the extent to which different societies value openness, would confound it.

To determine the possibility of subdimensionality and keep our procedures consistent with Bond and colleagues' analytic procedure, we factor-analyzed these five items using the principal-components analysis method (results are available from the first author on request). Varimax rotation of the first two principal components resulted in two factors that respectively explained 41.8 and 40.2 percent of the variance. The first factor, called social rewards, reflects an individual's intention of developing a friendship with member A outside the experimental context. The second factor, primary rewards, indicates the intended grade allocations to member A. We summed items in both factors; the resultant Cronbach alphas were .83 and .90, respectively. The intercorrelation between these two variables was .62 (p < .001).

Manipulation Checks

A principal-components factor analysis was conducted on eight 7-point semantic differential items measuring respondents' opinions of member A; Bond and colleagues originally developed these items as a manipulation check (1982: 193). We then rotated the first two components by a varimax process to obtain two factors: perceived interpersonal skills, which included the terms cooperative, kind, likable, good-natured, and persevering to describe member A, and perceived task skills, which included the terms responsible, efficient, and competent. These factors respectively explained 37.4 and 21.9 percent of variance. Summary indexes were obtained by summing the raw item scores over the constituent items for each of the two factors.

A significant main effect of task inputs on perceived task skills and a significant main effect of maintenance inputs on perceived interpersonal skills would provide evidence for effective manipulation. An analysis of variance for perceived task skills yielded the expected significant effect ($F_{2,380} = 13.17$, $p < .001$); means were 3.6, 4.2, and 4.4 for the low, intermediate, and high levels of task inputs. Thus, results provided evidence for the efficacy of the manipulation of task inputs.

The ANOVA for perceived interpersonal skills again yielded the expected main effect; it was highly significant ($F_{2,380} = 405.92$, $p < .001$), with means at 2.9, 4.2, and 5.4 for low, intermediate, and high levels. Unexpected was a significant main effect of task inputs on perceived interpersonal skills ($F_{2,380} = 7.51$, $p < .001$). This effect, however, accounted for only a small proportion (1.4%) of the variance, compared with 58.2 percent for mainte-

nance inputs. We therefore judged this unexpected result incapable of damaging what was otherwise very strong evidence for an effective manipulation of maintenance inputs. The two-way interaction effect was, as expected, not significant.

A potential differential influence of lopsided gender distributions in cells was assessed because earlier studies have shown that men use the equity norm more than women do (Landau & Leventhal, 1976; Leventhal & Lane, 1970). Results of post hoc four-way ANOVAs crossing task inputs, maintenance inputs, country, and gender confirmed neither a significant gender effect nor a significant country-by-gender interaction. Moreover, gender distributions in different cells did not significantly deviate from distributions in the national groups. We therefore ruled out differential gender effects. In sum, we judged the manipulation of both task and maintenance inputs to have been effective.

RESULTS

Table 1 reports means and standard deviations for each country by condition. We employed a three-by-three-by-three (country × task inputs × maintenance inputs) factorial design, with primary rewards and social rewards as the dependent variables. First, we conducted a multivariate analysis of variance to test the simultaneous effects of the independent variables on both dependent variables. Rao's F approximation of Wilks's lambda showed that all three main effects and two out of three two-way interaction effects were significant, with the three-way interaction effect not significant. To ascertain the separate effects of the independent variables on each dependent variable, we conducted an ANOVA on each of the two dependent variables.

An examination of the means in Table 1 reveals some interesting patterns. First, in allocating primary rewards, the U.S. students were the most generous, and the Japanese students the least generous. Second, the students in Korea were the most generous, with the U.S. and Japanese students less generous—and about equal—in giving social rewards. Third, the range of rewards given for varying levels of inputs was the broadest in the United States and the smallest in Korea. Finally, for all three countries and both kinds of rewards, subjects allocated more rewards to high levels of inputs than to low levels.

The main effects of the three independent variables were significant and were the effects of greatest magnitude (Table 2). The significant main effect of country reflects a cross-country difference in generosity in giving rewards. The significant main effects of task inputs and maintenance inputs appear to indicate that equity is probably a universal norm, although its normative strength varies across countries.

Our main interest lay, however, in a cross-country comparison of the levels of rewards allocated to different levels of group member inputs, and we expected the interaction effect of country with task or maintenance in-

TABLE 1
Means and Standard Deviations

Variables	Korea		Japan		United States		Combined Groups	
	Means	s.d.	Means	s.d.	Means	s.d.	Means	s.d.
Primary rewards								
Task inputs								
Low	3.59	1.38	3.07	1.45	3.64	1.15	3.43	1.34
Intermediate	4.24	1.13	3.93	1.39	5.05	1.05	4.41	1.27
High	4.85	1.21	4.95	1.47	5.80	0.97	5.20	1.29
Combined groups	4.23	1.34	3.98	1.61	4.83	1.38	4.35	1.48
Maintenance inputs								
Low	3.45	1.37	2.93	1.42	3.98	1.30	3.45	1.42
Intermediate	4.31	1.12	4.15	1.31	4.71	1.30	4.39	1.25
High	4.93	1.10	4.99	1.42	5.80	0.85	5.24	1.19
Combined groups	4.23	1.34	0.02	1.61	4.83	1.38	4.36	1.48
Social rewards								
Task inputs								
Low	3.73	1.37	3.18	1.33	2.93	1.35	3.28	1.38
Intermediate	4.20	1.55	3.87	1.64	3.83	1.96	3.97	1.72
High	4.67	1.39	4.18	1.41	4.64	1.70	4.50	1.51
Combined groups	4.20	1.48	3.74	1.52	3.80	1.82	3.92	1.62
Maintenance inputs								
Low	3.69	1.50	2.72	1.16	2.45	1.11	2.95	1.38
Intermediate	4.00	1.37	3.68	1.20	3.61	1.65	3.76	1.43
High	4.91	1.31	4.95	1.30	5.35	1.31	5.07	1.31
Combined groups	4.20	1.48	3.78	1.52	3.80	1.82	3.93	1.62

puts to capture differences. The effect of the interaction of task inputs and country on primary rewards was significant ($p < .01$), although small ($\omega^2 = .01$). Also significant ($p < .001$) is the effect of the interaction of maintenance inputs and country on social rewards, although again, the effect is small ($\omega^2 = .02$). These two interaction effects are plotted in parts A and B of Figure 1.

    With regard to primary rewards (part A), the curves representing the U.S. and Japanese groups are more or less parallel, but both are steeper than the Korean curve. These results offer no support for Hypothesis 1 but do support Hypothesis 2. With regard to social rewards (part B), the curve representing Korea is, contrary to our prediction, flatter than that representing either of the other two countries. Therefore, Hypotheses 3 is not supported. The curves representing Japan and the United States more or less overlap, so Hypothesis 4 lacks support. These results demonstrate that (1) regardless of the kind of allocation criteria used—task inputs or maintenance inputs—the overall reward pattern in a given country remains essentially the same, monotonically increasing; (2) the U.S. and the Japanese groups showed similar reward patterns; and (3) the U.S. and Japanese reward patterns approximated equity more closely than did the Korean group's pattern.

TABLE 2
Results of Analysis of Variance

Sources	df	Means	F	ω^2
Primary rewards				
Task inputs	2	91.49	98.85	.23
Maintenance inputs	2	102.59	101.93	.24
Country	2	23.35	23.20	.05
Task × maintenance	4	1.00	0.99	.00
Task × country	4	2.46	2.44**	.01
Maintenance × country	4	1.35	1.34	.00
Task × maintenance × country	8	1.72	1.71	.01
Error	362	1.01		
Total	388			
Social rewards				
Task inputs	2	49.31	33.45	.09
Maintenance inputs	2	146.23	99.20	.28
Country	2	6.85	4.65**	.01
Task × maintenance	4	8.41	5.71***	.03
Task × country	4	1.81	1.23	.00
Maintenance × country	4	7.45	5.06***	.02
Task × maintenance × country	8	1.52	1.03	.00
Error	362	1.47		
Total	388			

* $p < .05$
** $p < .01$
*** $p < .001$

A visual inspection of Figure 1 reveals that the Korean group had a unique reward allocation pattern. A departure from equity is highly pronounced at a low level of maintenance inputs (part B). We conducted tests of simple effects (ANOVAs across the levels of maintenance inputs) separately for each country (Lindman, 1974: 98–99). Post hoc comparisons of means using Scheffé's method showed that for the U.S. and Japanese groups, the means of all adjacent cells were significantly different (p < .05), indicating a preponderance of equitable reward allocations. For the Korean group, however, the cell means for the low and the intermediate levels of maintenance inputs were not significantly different at the .05 level.

DISCUSSION AND CONCLUSIONS

Students from the United States, Japan, and Korea participated in an experiment through which we attempted to replicate Bond and colleagues' (1982) study in different national settings. The most important general conclusion emerging from our study is that the equity norm is generalizable across countries. It appeared to exist in all three countries, although its strength varied. Additionally, a stronger tendency for groups to use an equity norm in allocating rewards was found in countries Hofstede identified as high in individualism.

FIGURE 1
Interaction Effects

Primary Rewards   Social Rewards

Part A

Part B

6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0

0.0

Low   Intermediate   High

Task Inputs

Maintenance Inputs

········ United States

———— Japan

———— Korea
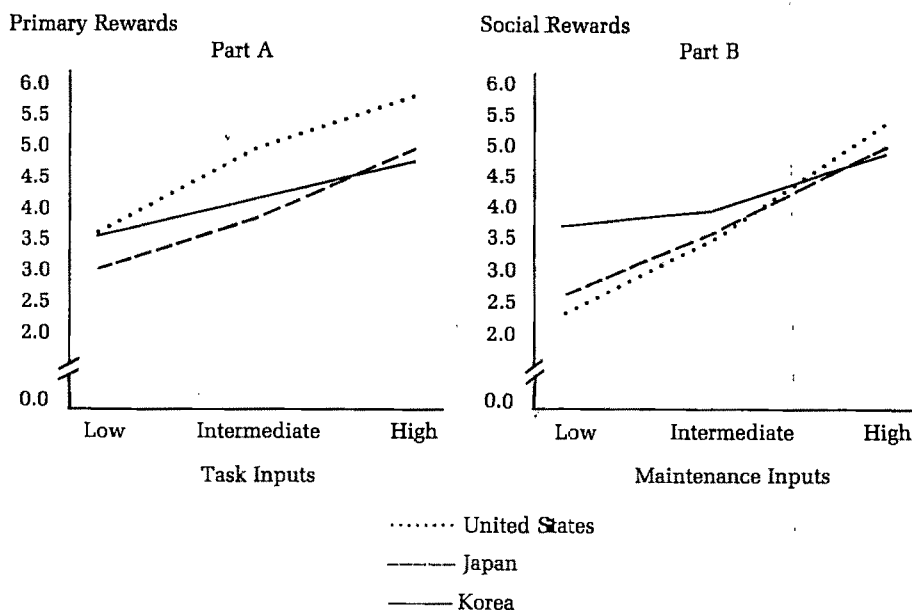
Japan, which scored significantly lower than the United States on Hof-stede's individualism measure, did not significantly differ from the latter in its emphasis on equity. One possible explanation is that Hofstede's "mas-culinity-feminity dimension" had an independent affect that added to the effect of the individualism dimension. In Hofstede's work, masculinity is the extent to which a society considers values like assertiveness, achievement, and material acquisition important. Femininity, the opposite end of the con-tinuum, reflects the value placed on nurturing interpersonal relationships.

It seems reasonable to speculate that the strong emphasis placed on achievement and acquisition in a masculine culture would contribute to an emphasis on equity as a reward allocation norm. Hofstede measured the masculinity-feminity dimension on a scale on which scores ranged from 5 to 95, with a mean at 49. Japan was rated 95, the highest among all 50 countries studied; the United States received a 62 and Korea, a 39. Perhaps Japan's extremely high masculinity level compensated for its relatively low level of individualism, resulting in no significant difference between the two coun-tries in the emphasis placed on equity. Another possible explanation is the effect of industrialization on reward allocation practices. The high level of industrialization in the United States and Japan, compared with that in Korea, might be responsible for the similar responses of the first two coun-tries' subjects.

Because maintenance inputs are thought to be instrumental for achiev-ing group harmony, we hypothesized that when maintenance inputs were

the allocation criterion, people from countries identified by Hofstede as more collectivistic would rely on the equity norm more heavily than would those from countries identified as less collectivistic. Our results did not confirm this expectation. The students from Korea, a collectivistic country according to Hofstede, were as moderate in rewarding maintenance inputs as in rewarding task inputs. This finding appears to add credence to the notion that in collectivistic societies, people may consider too much differentiation of rewards for any reason inimical to the fundamental goal of maintaining harmonious relationships in groups, and therefore to be avoided. The Koreans' pronounced moderation in allocating social rewards at the low maintenance level (part B, Figure 1) may further indicate that allocating social rewards is a sensitive issue in a collectivistic society. Being accepted socially may be a matter of such importance that people feel that even the lowest performer should not be denied the opportunity to be accepted socially and develop friendships.

Naturally, some caution should be taken in interpreting the current results. First, our study used country as a surrogate measure of individualism-collectivism. Taking direct measures from our subjects would have provided a much stronger ground on which to link culture to reward allocations. Second, although the hypothesized interaction effects of task inputs and country on primary rewards and of maintenance inputs and country on social rewards are statistically significant, they explain only small proportions of variance—1 and 2 percent, respectively. In contrast, the main effects of task and maintenance inputs are not only statistically significant but also explain much larger percentages of variance (23 and 28 percent, respectively). These results appear to underscore the need to recognize cultural similarities as well as differences (Harris & Moran, 1987; Tannenbaum, 1980). Equity is probably a phenomenon common to most cultures, but its strength will vary.

Third, we cannot claim that the universities providing data for the present study were functionally equivalent, since data collection was based more on convenience than on systematic sampling methods.

Although we recognize that extending the results of a laboratory study to the real world is hazardous, we suggest these conclusions: (1) incorporating some measure of equity as a performance contingency into compensation systems is common in most cultures and (2) lower use of equity as a norm characterizes cultures that tend to be collectivistic or feminine.

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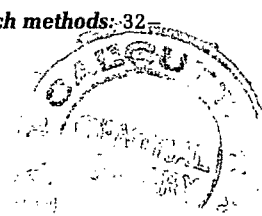
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APPENDIX
Dependent Variables[a]

Responses for all items except item 2 under "Primary Rewards" were on 7-point scales.

Primary Rewards

1. How would you grade member A? (excellent–very poor)
2. What would be the mark you give to member A on a 100% scale?

Social Rewards

1. What is the likelihood that you would choose member A as a friend outside the working group? (definitely would–definitely would not)
2. What is the likelihood that if you could make a choice, you would choose member A as a working partner again? (definitely would–definitely would not)
3. What is the likelihood that you would form a study group together with member A for the final examination in the course? (definitely would–definitely would not)

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[a] These items are based on the work of Bond, Leung, and Wan (1982)

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TOWARD THEORY-BASED MEASURES
OF CONFLICT MANAGEMENT

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The theory of the managerial grid, a model of interrelations among
styles of management, was used as the criterion for validating the two
best-known self-report measures of conflict management styles. We re-
analyzed six studies that used those measures and found that both
appeared to be moderately valid. However, the measures failed to re-
flect the underlying theory in a few respects, which suggested specific
areas for improving them.

Blake and Mouton's (1964) managerial grid has recently made a striking
comeback as a leading thesis in the literature on conflict management (Ka-
banoff, 1987; Pruitt & Rubin, 1986; Rahim, 1986; Shockley-Zalabak, 1988;
Van de Vliert & Prein, 1989). Most authors have treated the managerial grid
as a five-category scheme for classifying behavioral styles or modes of han-
dling social conflict. In our view, however, the grid expresses a more basic
scientific theory. The reasoning behind this view follows.

First, Blake and Mouton (1964, 1970) theoretically specified the simi-
larities and differences among five styles of conflict management, proposing
that the styles varied on two dimensions—concern for people and concern
for production. They devised 9-point dimensions, with 1 representing min-
imum concern and 9, maximum concern (see Figure 1). Other authors have
labeled the two dimensions differently (e.g., Rahim, 1983a, 1986; Shockley-
Zalabak, 1988; Thomas, 1976), but the basic assumptions have remained
similar. People are classified into the five styles on the basis of which of the
five two-dimensional locations in the grid they psychologically occupy.
Blake and Mouton define the respective styles as follows: avoiding, 1 on
people concern, 1 on production concern; accommodating, 9 on people con-
cern, 1 on production concern; compromising, 5 on people concern, 5 on
production concern; competing, 1 on people concern, 9 on production con-
cern; and collaborating, 9 on people concern, 9 on production concern. It is
important to note that the styles are viewed as specific points defined by the
two dimensions and not as areas.

The second reason for viewing the managerial grid as a scientific theory

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FIGURE 1
Theoretical Interrelations Among Five Styles of Conflict Management in Terms of Two Dimensions
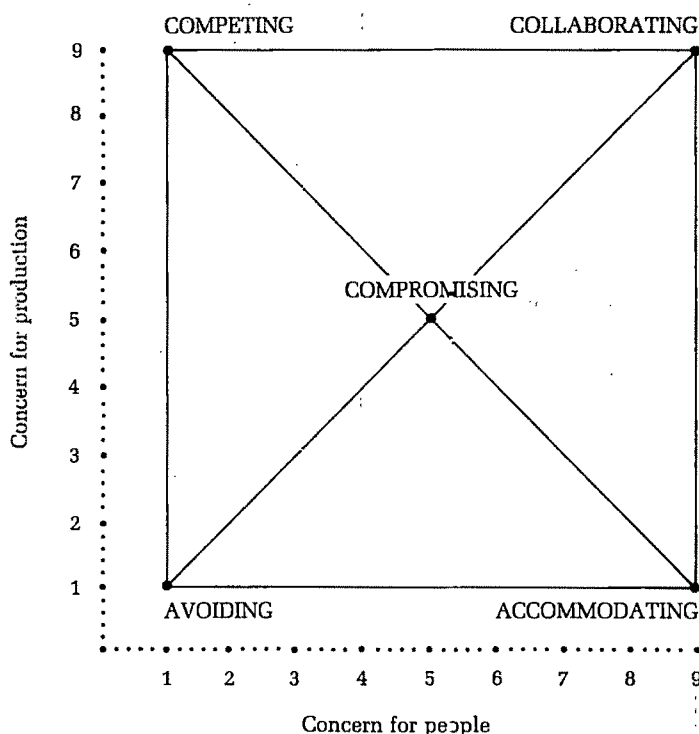
is that its originators conceptualized the two 9-point dimensions as interval rather than ordinal scales. Blake and Mouton called the intervals "units of direction" (1981: 442) and introduced a two-digit coding system in which, for instance, "9, 9" represented nine units of concern for people combined with nine units of concern for production. Other authors have implicitly or explicitly adopted their interval view by adding or subtracting an individual's scores on the two dimensions (e.g., Bobko, 1985; Chanin & Schneer, 1984; Ruble & Thomas, 1976; Van de Vliert & Prein, 1989).

Third, Blake and Mouton (1964, 1970, 1981) did not interpret the styles as simple additive combinations of people and production dimensions. Instead, they viewed each style as a distinctly different compound resulting from an interaction of the two underlying dimensions. Thus, the two dimensions composing a given style cannot be separated (Blake & Mouton, 1981: 441).

Fourth, the theoretical distances among the five behavioral styles are specifiable geometrically. Figure 1 presents the conflict management grid as a square matrix that has sides 8 units long and compromising at its midpoint. There are four distances of 8 units: avoiding to accommodating, accommo-

dating to collaborating, collaborating to competing, and competing to avoiding. Those four styles are equally closely related to compromising in the center, with a theoretical distance of 5.66 in each case. Maximally different relationships occur between avoiding and collaborating and between accommodating and competing, with theoretical distances of 11.31.

Thomas and Kilmann (1974) and Rahim (1983a) have published the two best-known questionnaires that people can use to describe their perceived use of the grid's five styles of conflict management (for a critique of the exhaustiveness and representativeness of the styles measured, see Knapp, Putnam, and Davis, 1988). A number of previous studies have assessed the validity of these instruments by means of empirically derived criteria (Cosier & Ruble, 1981; Kabanoff, 1987; Rahim, 1983a, 1983b; Ruble & Thomas, 1976; Thomas & Kilmann, 1978; Weider-Hatfield, 1988). The next section of this article briefly reviews results of these studies. The study reported here represents a new approach to construct validation of the Thomas and Kilmann (1974) and Rahim (1983a) operational definitions of the conflict management grid. We used the grid's theoretical pattern of ten distances among conflict styles as our validation criterion. Data came from a secondary analysis of six studies that used either Thomas and Kilmann's or Rahim's instrument.

METHODS

Instruments

Thomas and Kilmann's Management Of Differences Exercise (MODE) (1974) is an ipsative[1] questionnaire consisting of 30 sets of paired items, with each item describing one of the five conflict styles included in the managerial grid. A person's score on each style is the number of times he or she selects statements representing that style over other statements. The MODE styles appear to have rather low levels of homogeneity: across studies, Cronbach alphas have ranged from .34 to .91 with a mean of .58. Their stability also appears low, with test—retest reliabilities ranging across studies from .37 to .90 with a mean of .63. However, the level of social desirability bias affecting the measures also appears low (Kilmann & Thomas, 1977; Womack, 1988). Support for the MODE's validity includes demonstrated correlations between the five styles of conflict management and the two underlying dimensions (Ruble & Thomas, 1976) and demonstrated correlations between MODE scores and scores on other, related instruments (Brown, Yelsma, & Keller, 1981; Kilmann & Thomas, 1977). However, Kabanoff (1987), who used peer ratings of conflict behavior as criteria, failed to find evidence of external or predictive validity.

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[1] Ipsative measures cannot vary independently—that is, they systematically affect each other. Womack (1988) has discussed that the MODE's ipsative nature severely limits the type of statistical analyses that researchers can use.

TABLE 1
Characteristics of the Studies Analyzed

Study	N	Instrument Used
O'Reilly and Weitz (1980)	140	MODE
Mills, Robey, and Smith (1985)	199	MODE
Kravitz (1987)	96	MODE
Rahim (1983a)	1,219	ROCI
Kozan (1986)	134	ROCI
Weider-Hatfield and Hatfield (1987)	125	ROCI

The Rahim Organizational Conflict Inventory (ROCI) (Rahim, 1983a) is a series of 28 5-point Likert scales, with high values representing high use of a conflict style. The ROCI styles form an instrument that is internally consistent ($\alpha = .50-.95$, $\bar{x} = .74$), stable (test–retest reliability = $.60-.83$, $\bar{x} = .76$), and rather insensitive to social desirability response sets (Rahim, 1983b; Weider-Hatfield, 1988). The ROCI's ability to discriminate between groups known to differ in their conflict styles, its meaningful relations with other conflict constructs, and its associations with measures of organizational effectiveness and climate have provided evidence for its validity (Rahim, 1983a, 1983b, 1986; Weider-Hatfield, 1988).

Secondary Analysis

Only six studies satisfied the three requirements we established for inclusion in our reanalysis. These studies (1) used the MODE or ROCI instrument, (2) assessed managers' reports of how they handle organizational conflict, and (3) reported the ten intercorrelations among the five styles of conflict management. Table 1 identifies the six studies analyzed. We decided to use a distance measure based on correlations rather than raw scores or means because the latter are more susceptible to contamination by social desirability factors (cf. Kilmann & Thomas, 1977). Our criterion for judging the validity of each study's pattern of ten intercorrelations was the corresponding pattern of ten theoretical distances shown in Figure 1. If the MODE and ROCI instruments were perfectly valid the intercorrelations between compromising and the other four styles would have the highest positive (or least negative) values because those correlations represent the shortest distances. Similarly, the two intercorrelations corresponding to the two longest distances (avoiding-collaborating and accommodating-competing) would be the most negative. Finally, the four intercorrelations corresponding to the four intermediate distances (avoiding-accommodating, accommodating-collaborating, collaborating-competing and competing-avoiding) would fall between the other two subsets of correlations.

The reanalysis had two steps. The first was a validity assessment conducted by calculating Spearman rank correlations, corrected for ties of identical values, between the ten intercorrelations among conflict management styles (the MODE or ROCI score in a particular study) and the ten theoretical

distances derived from the conflict management grid (the validation criterion).[2] This analysis indicated how valid each instrument was in terms of the similarity between the pattern of empirical associations among the five styles and the theoretical pattern of associations the grid specifies.

The second step explored how much each of the five different styles contributed to the overall validity of the MODE or ROCI. In this exploration, we used a nonmetric distance-scaling program, called MINISSA, designed by Lingoes and Roskam (1973). The purpose of the procedure is to find a configuration of points whose Euclidean output distances reflect as closely as possible the rank order of the input dissimilarities. Like a Spearman rank correlation analysis, this scaling analysis is a robust procedure that does not rely on the assumption that the conflict management grid provides precise distances on interval scales. Applying Lingoes and Roskam's procedure to a set of ten MODE or ROCI intercorrelations resulted in a two-dimensional representation of the five styles of conflict management. This visual pattern of empirical relationships, based on correlations among styles in the MODE or ROCI instruments, can be compared directly to the pattern of theoretical relationships that provide the validation criterion (Figure 1).

RESULTS

The last column in Table 2 reports the Spearman estimates of the relationship between each study's ten intercorrelations among the conflict styles from the managerial grid and the corresponding ten theoretical distances. The coefficients indicate that MODE predicts 9 to 36 percent of the variance implicated by the theoretical pattern of the conflict management grid and ROCI predicts 24 to 35 percent of the variance implicated. Four coefficients are insignificant, and two reach a .05 level of significance in a one-tailed test. In view of these low levels of significance, it seems important to consider the magnitude of the correlations ($\bar{x} = -.50$), given the small number of degrees of freedom. In interpreting the results, we also took into account that the ten intercorrelations among the styles are not independent. Table 2 shows that an ipsative questionnaire like the MODE produces negative dependence among its correlations, whereas the Likert-type items of the ROCI produce positive dependence among them. Consequently, the validity coefficients may actually underestimate the MODE's true relationship with the conflict management grid and overestimate the ROCI's relationship (cf. Schiffman, Reynolds, & Young, 1981: 258). Therefore, we concluded that overall, the MODE and ROCI are moderately valid measurements of the grid-based managerial conflict styles.

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[2] There were two reasons to apply a Spearman rank correlation rather than a Pearson product-moment correlation. First, because the criterion has only three values or distances— 5.66, 8.00, and 11.31—the Pearson coefficient underestimates the validity of an instrument. Second, the Pearson coefficient requires measurement at an interval level, but the Spearman coefficient does not. The latter would be suitable even if the distances in the conflict management grid did not have strict geometric properties.

Intercorrelations Among Five Styles of Conflict Managemen

Studies	Avoiding-Accommodating	Avoiding-Compromising	Avoiding-Competing	Avoiding-Collaborating	Styles of Confli Accommodatin Compromisin
MODE					
O'Reilly & Weitz	.17	−.20	−.47	−.36	−.15
Mills, Robey, & Smith	.05	−.35	−.24	−.41	−.09
Kravitz	.11	−.13	−.48	−.35	−.17
Mean	.11	−.23	−.40	−.37	−.14
ROCI					
Rahim	.33	.16	.01	−.08	.26
Kozan	.31	.27	−.01	−.02	.52
Weider-Hatfield & Hatfield	.42	.08	−.03	−.04	.30
Mean	.35	.17	−.01	−.05	.36

[a] Spearman rank correlations are shown. The more negative the correlation between a study's ten intercorrelatic indicate closeness whereas the distances indicate separateness.

† $p < .10$
* $p < .05$

Using Fisher's r to Z transformation, we then computed the mean inter-correlations for the six studies analyzed. The correlation between the result-ing two rows of mean intercorrelations (Table 2; $r_S = .41$, n.s.) can be con-sidered an indication of the concurrent validity of the MODE and ROCI. Results suggest that the concurrent validity does not exceed the mean the-ory-based validity: for MODE, $r_S = .52$, n.s.; for ROCI, $r_S = .62$, $p < .05$.

The exploratory two-dimensional representations of the mean intercor-relations among the five conflict styles provided by each instrument fit the data very well; in both cases, stress was low ($\hat{d} < .001$). The relationships shown in Figure 2 suggest four main conclusions: (1) the MODE and ROCI patterns of empirical relationships are topologically equivalent and gener-ally similar to the theoretical configuration shown in Figure 1; (2) both instruments produce a relatively short distance between avoiding and ac-commodating and therefore do not clearly discriminate between these two nonconfronting ways of handling conflict; (3) compromising does not oc-cupy a midpoint position; and (4) the MODE does not discriminate as clearly between competing and collaborating as the ROCI does.

DISCUSSION

In this research, we reinterpreted Blake and Mouton's (1964, 1970) grid for assessing conflict management styles as a theoretical model of quantita-tively specified interrelations among five styles of conflict management: avoiding, accommodating, compromising, competing, and collaborating.

2

Validated Against Theory-Based Distances

Management					
Accommodating- Competing	Accommodating- Collaborating	Compromising- Competing	Compromising- Collaborating	Competing- Collaborating	Validity[a]
−.53	−.25	−.27	−.34	.00	−.48†
−.53	−.38	−.28	−.03	−.12	−.60*
−.34	−.28	−.41	−.31	−.06	−.30
−.47	−.30	−.32	−.23	−.06	−.52†
.11	.14	.07	.23	−.04	−.59*
.05	.12	−.04	.52	−.07	−.52†
−.07	.15	−.14	.44	−.03	−.49†
.03	.14	−.03	.40	−.05	−.62*

and the ten theoretical distances shown in Figure 1, the higher the degree of validity because the intercorrelations

FIGURE 2
Empirical Interrelations Among Five Styles of Conflict Management for Two Instruments
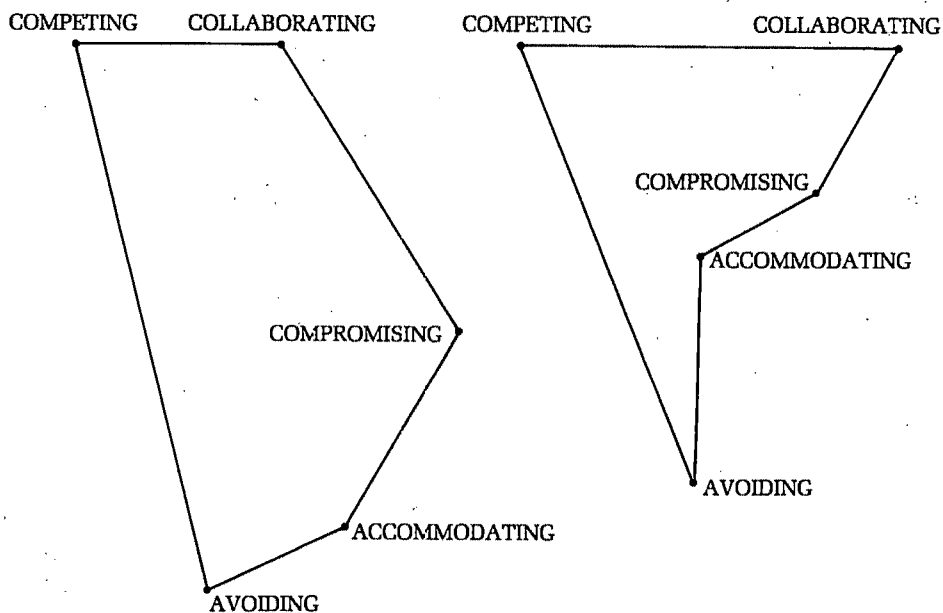
MODE (Thomas & Kilmann, 1974)   ROCI (Rahim, 1983a)

Consequently, we were able to validate measurements of the styles in a straightforward manner by comparing the pattern of intercorrelations each measurement produced with the pattern specified by the conflict grid. The approach taken here differed from that of earlier validation studies in several ways. Our criterion of validity, which was theoretically derived rather than purely empirical, was complex, composed of ten subcriteria. Moreover, the criterion embraced a pattern of ten components rather than a series of single points, and each part of the criterion pattern referred to the relationship between two behavioral styles rather than to a value on a single dimension of a behavioral style: we examined correlations instead of means. This validation approach may have additional applications in situations in which complex interrelated criteria have to be used

By reanalyzing data from six studies of managers, we assessed the theory-based construct validity of the two best-known self-report instruments for measuring the five conflict styles originally defined in Blake and Mouton's (1964) managerial grid (Rahim, 1983a; Thomas & Kilmann, 1974). We concluded that both instruments showed a moderately strong relationship with the theory on which they are based. The patterns shown in Figure 2 represent slightly distorted versions of the square matrix described by the grid in Figure 1. These results may be interpreted as suggesting that either the theory of the conflict management grid or the measuring instruments lack high validity. It is relevant to note that both instruments appear to have a relatively low degree of concurrent validity. Thus, we suggest that Figure 2 indicates that the two instruments, the MODE and the ROCI, lack high validity. What are their specific deficits?

A shortcoming of Thomas and Kilmann's (1974) MODE is that it discriminates poorly between the theoretically and practically important styles of competing and collaborating. By contrast, Rahim's (1983a) ROCI discriminates extremely well between these two conflict styles. Inspection of individual items suggests that competing rather than collaborating is responsible for the greater discriminative power of the ROCI. The ROCI emphasizes the use of power in an individual's style of competing, but the MODE items for competing fail to mention power at all.

Users of the ROCI, however, must pay greater attention to differentiating between compromising and collaborating. We disagree with Pruitt (1983: 173), who described compromising as merely "lazy" or "half-hearted" problem solving that is therefore indistinguishable from collaborating (cf. Pruitt & Rubin, 1986). A more useful explanation of the association between the two styles might be that although specific compromising and collaborating behaviors differ, their respective outcomes—a settlement and a resolution—have some common features, and their final social-psychological consequences tend to be the same (Van de Vliert & Hordijk, 1989). If that hypothesis is valid, items referring to compromising and collaborating should focus on distinct behavioral characteristics of the two styles rather than on their direct or indirect consequences. For example, the instruments might be improved by contrasting distrustful negotiating with trusting exchange of opin-

ions and problem solving, and sudden impasses with continuous exploration.

Both instruments more or less failed to discriminate between avoiding and accommodating. A perusal of items suggests that avoiding and accommodating share a common theme: in both, an individual complies with an opponent's wishes. It may be possible to increase the distance between these nonconfronting strategies by contrasting the covert and uncooperative character of avoiding with the overt and cooperative character of accommodating. Sternberg and Dobson provided a good illustration of the difference involved in the following items from a questionnaire they devised: "I tried to avoid the conflict whenever possible, especially any discussion or open confrontation with the other person" versus "I attempted to defuse the conflict either by apologizing to the other person or by giving in to the person's demands" (1987: 797).

In conclusion, we suggest that the MODE and ROCI instruments are moderately valid measurements of the conflict management theory underlying their construction. Both instruments also measure some of the theoretical interrelations more adequately than they measure others. Therefore, although both are promising approaches, considerable room for improvement remains.

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Other footnotes should be used sparingly. Minimize their use for parenthetical discussion; material that is pertinent can often be integrated into the text. They should *not* be used for citing references (see References below). The text for all footnotes should appear on a separate page or pages at the end of the body of the article.

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Main headings should be used to designate the major sections of the article; three or four main headings should be sufficient for most articles. Initial headings, such as "Introduction," are unnecessary. Main headings should be centered on the page and typed in all capitals. They should *not* be underlined. Example:

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Secondary headings should be typed flush with the left margin and in small letters, with major words beginning with capitals. Secondary headings should *not* be underlined. Example:

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Third-order or *paragraph headings* should begin with a standard paragraph indention and be typed in capital and small letters, with only the initial word capitalized. Paragraph headings should be followed by a period; they should *not* be underlined. Example:

Manager sample. Respondents consisted of a random sample of 300 managers. . . .

The text should follow on the same line.

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Tables should be typed, double-spaced, on separate pages (one page for each table) from the text. They should be grouped together following the appendixes. If there is no appendix, tables should follow the references. For most papers, the first table should report descriptive statistics, including means, standard deviations, and a complete intercorrelation matrix. Each table should have the word TABLE (typed in all caps) and its number (arabic numerals) centered at the top. The table title should be in capital and small letters and centered on the page directly under the table number; it should not be underlined. Example:

TABLE 1
Firms in Sample

Tables should be numbered consecutively from the beginning to the end

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FIGURE 1
Model of Contextual Influences on Performance

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An alphabetically ordered list of references cited in the text should be included at the end of the article. References should begin on a separate page headed REFERENCES. Continue the pagination.

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> Several studies (Adams, 1974; Brown & Hales, 1975, 1980; Collins, 1976a,b) support this conclusion.

Note the use of alphabetical order and an ampersand in citations.

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>
> (first citation)
>
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>
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Kahn, R. L., & Boulding, E. (Eds.). 1964. Power and conflict in organizations. Glencoe, Ill.: Free Press.
Katz, D., & Kahn, R. L. 1978. The social psychology of organizations (2nd ed.). New York: John Wiley & Sons.
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Duncan, R. G. 1971. Multiple decision making structures in adapting to environmental uncertainty. Working paper No. 54–71, Northwestern University Graduate School of Management, Evanston, Ill.

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Wall, J. P. 1983. Work and nonwork correlates of the career plateau. Paper presented at the annual meeting of the Academy of Management, Dallas, Texas.

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Submissions should be sent to Professor Richard T. Mowday, *Academy of Management Journal*, College of Business Administration, University of Oregon, Eugene, Oregon 97403-1208.

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CONTENTS
Volume 33, Number 2, June 1990

RESEARCH NOTES

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As of July 15, 1990, new submissions to the *AMJ* should be sent to:

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New submissions prior to July 15 and papers under revision should continue to be sent to Richard T. Mowday at the University of Oregon.

WHAT'S IN A NAME? REPUTATION BUILDING AND CORPORATE STRATEGY

CHARLES FOMBRUN
New York University
MARK SHANLEY
University of Chicago

Firms compete for reputational status in institutional fields. Managers attempt to influence other stakeholders' assessments by signaling firms' salient advantages. Stakeholders gauge firms' relative merits by interpreting ambiguous informational signals from the firms, the media, and other monitors. The results of an empirical study of 292 large U.S. firms supported the general hypothesis that publics construct reputations on the basis of information about firms' relative structural positions within organizational fields, specifically using market and accounting signals indicating performance, institutional signals indicating conformity to social norms, and strategy signals indicating strategic postures. Understanding the informational medium from which publics construct reputations helps explain sources of mobility barriers within industries that originate in external perceptions.

Corporate audiences routinely rely on the reputations of firms in making investment decisions, career decisions, and product choices (Dowling, 1986). Reputations signal publics about how a firm's products, jobs, strategies, and prospects compare to those of competing firms. Favorable reputations can therefore generate excess returns for firms by inhibiting the mobility of rivals in an industry (Caves & Porter, 1977; Wilson, 1985).

Reputations may have other potentially favorable consequences. By signaling consumers about product quality, favorable reputations may enable firms to charge premium prices (Klein & Leffler, 1981; Milgrom & Roberts, 1986b), attract better applicants (Stigler, 1962), enhance their access to capital markets (Beatty & Ritter, 1986), and attract investors (Milgrom & Roberts, 1986a). Ultimately, reputational orderings crystallize the statuses of firms within an industrial social system (Shrum & Wuthnow, 1988) and thereby constitute an important venue for reconciling economic and sociological contributions to the study of industrial stratification (Fombrun, 1986).

Few empirical investigations have sought to understand the factors that influence corporate reputations. In a study of the *Fortune* 500, McGuire, Sundgren, and Schneeweis (1988) found that prior return on assets was highly correlated with a firm's reputation for social responsibility, which suggests that economic performance serves an important signaling function when publics construct reputational rankings of firms.

Yet economic performance is not the only basis on which to assess firms. Firms serve multiple stakeholders, each of which applies distinct criteria in evaluating corporate performance (Freeman, 1984). A theoretical articulation of reputation as a construct should therefore anticipate the multiple economic and noneconomic criteria different constituents are likely to apply in assessing firms.

This article interprets reputations as the outcome of a competitive process in which firms signal their key characteristics to constituents to maximize their social status (Spence, 1974). Because of informational asymmetries in the market for reputational status, each of a firm's multiple publics selectively attends to different informational cues, or signals, in judging its effectiveness. Following Spence, we defined signals as "alterable observable attributes" (1974: 107).

Although many signals broadcast to constituents are under firms' control, others emanate from external monitors. We therefore proposed specific hypotheses relating assessments of reputation to various informational signals emanating from firms and their audiences: market and accounting signals representing corporate performance, institutional signals depicting firms as more or less visible, attractive, and socially responsive, and strategy signals defining firms' corporate postures. We tested this model of reputation building with data from a set of *Fortune* 500 firms.

REPUTATION BUILDING: INTERPRETING AMBIGUOUS SIGNALS

Just as firms compete for customers, so also do they vie for reputational status. Publics construct reputations from available information about firms' activities originating from the firms themselves, from the media, or from other monitors. Publics use and propagate information they deem important for assessing firms' successes and failures at acquiring resource inputs, improving throughputs, and sustaining outputs. As signals about firms' activities, achievements, and prospects diffuse, individual interpretations aggregate into collective judgments that crystallize into reputational orderings of firms in organizational fields (DiMaggio & Powell, 1983). Established reputations themselves are signals that also influence the actions of firms' stakeholders.

Reputational rankings constitute a potentially significant and understudied form of normative control that channels firms' actions by conferring relative competitive advantage and disadvantage upon conforming organizations within an organizational field (Shapiro, 1987; Shrum & Wuthnow,

1988). If firms value their reputations, the desire to protect them can inhibit them and their managers from engaging in activities constituents deem unacceptable. Established reputations may, therefore, impede managers' strategic responses to environmental events and are thus a distinct source of intraindustry structure (Caves & Porter, 1977).

Fombrun and Zajac (1987), for instance, demonstrated how top managers' perceptions of environments induced different patterns of intraindustry stratification—and hence of rivalry—than predictions based on purely structural variables suggested. If reputational rankings are widely publicized (as, say, *Fortune's* have become), they may alter managers' perceptions of environmental threats and opportunities and of their firms' strengths and weaknesses (Dutton & Jackson, 1987) and so influence the mobility barriers that managers enact: Well-reputed firms have a competitive advantage within their industries, but poorly reputed firms are disadvantaged. As Wilson pointed out, "the essential requirement for a player's reputation to matter for his current choice of action is his anticipation that his later decisions will be conditioned by his later reputation" (1985: 27).

Since different publics attend to different features of firms' performance, reputations reflect firms' relative success in fulfilling the expectations of multiple stakeholders (Freeman, 1984). The more informational asymmetry and ambiguity characterize the interactions between managers and stakeholders, the more likely the latter are to search for information (Shrum & Wuthnow, 1988).

With homogeneous evaluators and informational symmetry between managers and constituents, reputations would be irrelevant and epiphenomenal. Figure 1 presents a model of reputation building under the more realistic conditions of incomplete and ambiguous information and heterogeneous publics. The figure suggests that reputations represent publics' cumulative judgments of firms over time. By showing how previous evaluators have resolved ambivalence in firms' performance, reputations inform publics about current ambivalence and influence firms' actions. As Wilson wrote about reputation building among individuals,

> Differences in the information available to participants make their strategies acutely sensitive to their beliefs and expectations. This in turn affects the behavior not only of the uninformed person, but also of the informed one, who realizes that his current actions affect others' later beliefs, their expectations about his subsequent behavior, and ultimately their choice of actions. Knowing that this chain of events will occur, the informed person has an incentive to trade off the immediate consequences of his current decision against the long-term effects of his reputation (1985: 59).

Although in this study we only addressed the determinants of reputation, reputational consequences are also worthy of considerable attention in future research. Economists model many apparently inconsistent behaviors

FIGURE 1
Model of Reputation Building Under Conditions of Incomplete
Information[a]
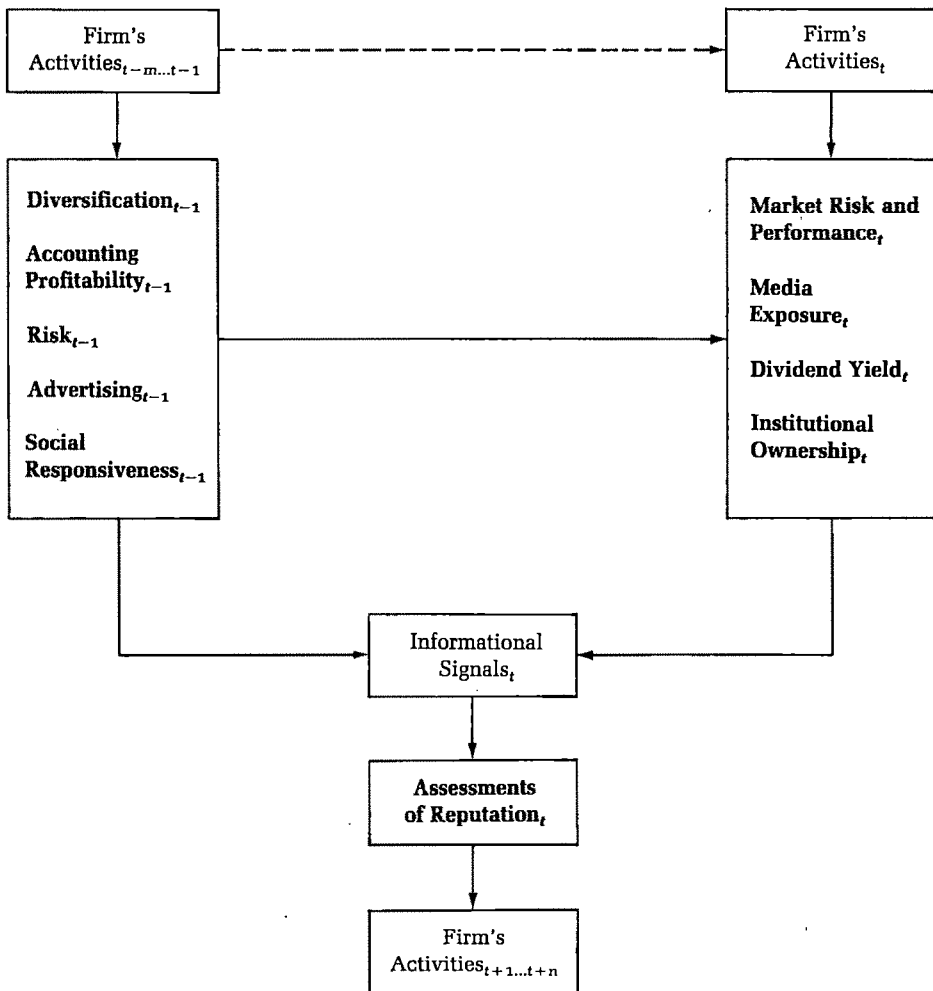
[a] All constructs estimated in the analyses are in bold typeface.

by assuming that reputations are assets in which individuals and firms invest, requiring them to trade short-term pay-offs for long-term benefits (Wilson, 1985). Such an investigation would require a strong theoretical model capable of recognizing the simultaneous contributions to subsequent profitability of both a firm's prior reputation and its entire performance history and including other industry- and firm-level variables and evaluative criteria with varying time lags. Lacking such a model, McGuire, Sundgren, and Schneeweis (1988) may have concluded prematurely that a reputation for

social responsibility had little effect on various measures of performance.[1]
Nonetheless, we agree with those researchers that in the short run, "it may
be more fruitful to consider financial performance as a variable influencing
... [reputation] than the reverse" (1988: 869).

This study investigated hypotheses derived from the notion that firms
compete for reputation in a market characterized by incomplete information.
In framing hypotheses, we followed the outline of Figure 1 and assumed that
corporate audiences attend to market, accounting, institutional, and strategy
signals about firms.

Market Signals

Market signals present information to constituents about firms' current
activities, results, and prospects. External analysts, creditors, and investors
are particularly attuned to the market performance of firms and routinely
incorporate such data in their trading decisions (Fama, 1970). Through in-
formal networks and formal reports, their assessments of firms' prospects
diffuse through capital markets and contribute information to other publics'
judgments (Shrum & Wuthnow, 1988).

Market performance and market risk. High performance and low risk
predispose constituents to assess firms and their managers favorably. Klein
and Leffler (1981) proposed a model explaining the price premiums firms
obtain for high-quality products in terms of requiring investments in non-
salvageable assets like advertising and charitable contributions to maintain
consumer purchases, particularly in the case of products whose merits are
not verifiable prior to purchase. Just as prices signal product quality to
consumers, high economic performance signals a firm's inherent quality to
investors and creditors.[2] Firms that report high performance and low risk

---

[1] The high correlation (.41) McGuire and colleagues (1988) reported between 1982 reputa-
tion for social responsibility and average ROA for 1982–84 is deceiving. Not only does such a
bivariate analysis fail to control for multiple firm- and industry-level influences on ROA, it also
glosses over the joint influence of a firm's performance history on both reputation and values of
ROA. A better estimate is obtained by correlating the residuals obtained from two regressions of
(1) ROA_{t-2} and ROA_{t-1} on ROA_t and (2) ROA_{t-2} and ROA_{t-1} on reputation$_{t-1}$. We ran these
analyses for three years of data and obtained the following.

Variables	Simple Correlations	Correlations of Residuals
1982 reputation × ROA, 1983	.45***	.09
1982 reputation × ROA, 1984	.41***	.07
1982 reputation × ROA, 1985	.26***	−.03

*** $p < .001$

The nonsignificant correlations between the residual scores indicate that a stronger model is
required to investigate the implications of reputation for subsequent performance.

[2] The analogy may appear somewhat stretched since firms do not as a rule select perfor-
mance levels. However, managers are known to manipulate accounting data to present a clean
balance sheet or to reduce their tax liability. Often, they also take aggressive action to boost their
stock price or otherwise influence market value.

convey information to the capital markets and other constituencies about the proven merits of their strategic trajectories and future prospects. Optimistic projections in turn incline some publics to purchase those firms' equity offerings, thereby increasing their market value and also signaling other publics that the firms have the inherent potential to meet some of their objectives, be they economic or social. The market value and market risk of firms provides investors and their advisors, as well as firms' competitors and other auditors, with both firm-specific and comparative information. Ceteris paribus, investors prefer high market returns and low market risk, suggesting:

> Hypothesis 1: *The greater a firm's current market performance, the better its reputation.*

> Hypothesis 2: *The greater a firm's current performance-adjusted market risk, the worse its reputation.*

Dividend policy. Another aspect of market performance that investors attend to is a firm's dividend policy (Walter, 1971). Dividend payouts, however, can signal rival messages. Some publics may interpret high distributions as indicating that a firm has tapped a more profitable and protected niche than competitors, but others may regard high distributions as a signal that the firm's managers lack attractive investment opportunities capable of ensuring future cash flows (Ross, 1977). These expectations, however, should also influence the stock price of the firm, increasing it in the first case and decreasing it in the second. The dividend yield—a ratio of dividend payout to stock price—is therefore a useful indicator of whether publics take a short- or long-run view of firms. Ross and Westerfield suggested that "firms with high growth prospects will generally have lower dividend yields" (1988: 41). If publics take a long-term view when they assess the reputational status of a firm, then

> Hypothesis 3: *The greater a firm's current dividend yield, the worse its reputation.*

Accounting Signals

Accounting data provide an obvious source of information to constituencies interested in firms' economic performance. Financial statements indicate both the current results of prior activities and the current resource allocations the firms' managers have made. They therefore signal the merits of firms.

Accounting profitability and risk. Since long-run effectiveness requires firms to be profitable,

> Hypothesis 4: *The greater a firm's prior accounting profitability, the better its reputation.*

Ceteris paribus, however, publics are risk-averse: Constituents expect a high level of return from firms whose strategies demonstrate high levels of risk (Bettis & Mahajan, 1985). For two firms with similar levels of profitability, therefore, greater risk should negatively influence publics' assessments. Hence,

> *Hypothesis 5: The greater a firm's prior performance-adjusted accounting risk, the worse its reputation.*

Institutional Signals

Economic outcomes are not the only source of information important to all firms' constituencies. Firms belong to institutional environments that influence constituents' assessments: institutions often hold their stock; some firms expend heavily on social welfare, frequently through their own foundations; and the news media propagate information about their activities.

Institutional ownership. Patterns of institutional ownership are known to affect the behavior of firms' managers. For instance, when institutions hold more of a firm's stock than individuals, managers invest less in R&D (Graves, 1988). The composition of investors in firms' shares arguably sends a strong signal to their other constituents. The more institutional investors there are, the more likely some publics are to view firms favorably, taking it for granted that careful screening by well-informed portfolio analysts led to the institutional purchase decision.

> *Hypothesis 6: The greater the concentration of a firm's equity among institutions, the better its reputation.*

Social responsibility. Publics also judge how well firms respond to their noneconomic agendas. Perceptions of firms' concern for the wider society may influence judgments, with social responsiveness signaling that firms have achieved a mutualistic relationship with potentially powerful groups in their environments. Social and political involvement, of course, may tie in directly to a firm's continued ability to operate, or they may represent a means of thwarting environmental challenges from powerful stakeholders (Pfeffer & Salancik, 1978).

Managers can signal their firms' social concern by contributing to charitable causes, developing nonpolluting products, achieving equal opportunity employment, creating foundations, placing women and minority members on boards, or adhering to the Sullivan principles[3] (Lydenberg, Marlin, & Strub, 1986; Ryan, Swanson, & Buchholz, 1987). Managers presume that social responsiveness generates goodwill from employees, consumers, and other publics that enhances the long-run profitability and viability of firms and protects their own employment.

> *Hypothesis 7: The greater a firm's contributions to social welfare, the better its reputation.*

Media visibility. Managers' strategic attempts to influence constituents contribute to propagating information that in turn gets disseminated through networks of interpersonal relations or interlocking corporate ties (Mizruchi & Schwartz, 1987) and through press articles and mass media presentations

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[3] The Sullivan principles are voluntary guidelines proposed in the mid-1970s by the Rev. Leon Sullivan to encourage U.S. firms to implement nondiscriminatory labor practices in South Africa and to support progressive projects for blacks in the communities in which the companies operate (Lydenberg, Marlin, & Strub, 1986: 30–33).

(McQuail, 1985). The media themselves act not only as vehicles for advertising and mirrors of reality reflecting firms' actions, but also as active agents shaping information through editorials and feature articles (Fombrun & Abrahamson, 1988).

Publics also differ in how much importance they attach to the domains in which firms operate. Involvement in a turbulent domain, for instance, enhances a firm's media visibility. Just as information availability biases individual judgments (Tversky & Kahneman, 1974), the availability of information in an arena may shape a particular audience's assessment of firms' activities: Publics are more likely to perceive as important the domains that receive the greatest media attention (McQuail, 1985). Greater visibility can be expected of firms operating in controversial product-market domains (tobacco and biotechnology), in national and regional public policy debates (aerospace and defense), and in risky technologies (nuclear power and chemicals).

Both the mass media and specialized publications also propagate evaluations of firms. Again, much as the availability of information biases individuals' judgments (Tversky & Kahneman, 1974), so may the amount of information channeled through informal networks, the business press, and the mass media bias publics' constructions of firms' reputations. Firms frequently and nonnegatively touted by the media might therefore develop better reputations than other firms because they occupy more central positions in a social network (Burt, 1983). This suggests two principal hypotheses and an interaction:

> *Hypothesis 8: The greater a firm's current media visibility, the better its reputation.*
>
> *Hypothesis 9: The more nonnegative a firm's current media coverage, the better its reputation.*
>
> *Hypothesis 10: Nonnegative coverage and visibility have a positive, interactive effect on reputation.*

Firm size. As institutions in their own right, large firms tend to receive much public scrutiny. The availability of information may benefit large firms disproportionally by inflating audiences' familiarity with their activities (Tversky & Kahneman, 1974). Assuming that corporate audiences asked to rate firms' reputations less readily remember small firms,

> *Hypothesis 11: The larger the firm, the better its reputation.*

Strategy Signals

Publics also assess firms on the basis of the payoffs likely from their managers' choice of business and corporate strategies. At the business-unit level, firms develop differentiated strategic postures by allocating resources in different ways across functional areas (Fombrun & Ginsberg, 1989). At the corporate level, firms differ in their diversification postures or the degree to which their activities span multiple related and unrelated businesses

(Rumelt, 1974). The extent of a firm's diversification informs constituents about corporate managers' preoccupations and therefore signals the firm's future prospects.

Differentiation. Over time, advertising helps firms develop strategic positions that are differentiated from their competitors' and that provide them with a measure of goodwill from consumers and other stakeholders (Rumelt, 1987; Weiss, 1969). Advertising not only signals product and firm characteristics in ways that can reduce constituents' searches for information but also presents firms in a favorable light.

Common to economic models of reputation building is a view of advertising as a source of product and imaging cues designed to influence the perceptions of external publics. Strategic decisions represent choices for a sequence of games[4] in which firms advertise to reduce consumer search (Stigler, 1961), stabilize output disposal (Milgrom & Roberts, 1986a), and increase barriers to entry (Comanor & Wilson, 1974). Similar models can be formulated for firms' investments in ensuring inputs and improving throughputs. Just as advertising helps induce a protected strategic position that stabilizes sales, so can investments in improved supplier, customer, and employee relationships enhance the quality of firms' input supplies, improve their pool of new recruits, lower their labor costs, raise their productivity, and thereby build unique and protected strategic niches (Schuler & MacMillan, 1984).

If firms develop strategic postures from cumulative resource allocations across functional domains (Fombrun & Ginsberg, 1989), by deploying resources to research and advertising and by maintaining tightly knit cultures, stable supplier relations, and high-productivity technologies, managers signal constituents about firms' strategic postures and transform their own histories into reputations (Kreps & Spence, 1985). In particular, differentiation may result from advertising allocations.

> *Hypothesis 12: The greater a firm's advertising intensity,*
> *the better its reputation.*

Diversification posture. Some constituents may interpret diversification as increasing efficiency because administrative costs are likely to fall if a firm adopts a conglomerate structure. Other constituents, however, may expect lowered efficiency from diversification because of functional duplication. The two interpretations may coexist among different publics, and which one is most influential may depend on the information available about managers' actions.

Diversification also spreads risk and provides firms with a hedge against downturns in single products or markets that some investors might welcome (Bettis & Hall, 1982). Some previous research has cautioned against broad diversification, however, and noted that the capital markets favor firms that only diversify into related product-market domains to capitalize on synergy

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[4] For a current review of game-theoretic approaches to strategy, see Shapiro (1989).

(Bettis, 1981; Rumelt, 1974). Such interpretations, if believed by firms' constituents, suggest that relatedness enhances firms' reputations.

If reputations partly reflect publics' interpretations of the merits of firms' strategic postures, the reputations of unrelated diversifiers might decline, not only because constituents expect them not to capitalize on production synergies between domains, but also because inclusion under a broad corporate umbrella hampers actual capital allocations within divisions. Unrelated firms, for instance, may spirit cash away from profitable divisions instead of reinvesting it in needed R&D (Hoskisson & Hitt, 1988), spend less on advertising (Bettis, 1981), and carry a high percentage of debt (Barton & Gordon, 1988)—actions that may worsen a firm's external image and increase its perceived riskiness to investors.

Finally, corporate managers of unrelated diversifiers control the release of division-level data and may be less encumbered by the reporting requirements of public auditors than their counterparts in focused firms (Ronen, 1982). Unrelated diversification may make a firm more opaque to constituents because of corporate managers' greater ability to control the presentation of divisional results and activities in consolidated public statements. External audiences might therefore discount unrelated portfolios because informational signals about individual divisions may be ambiguous and distorted, may serve the purposes of incumbent managers, and hence may be more difficult to interpret than signals from focused firms. Jointly, these arguments suggest that

> Hypothesis 13: The greater a firm's unrelated diversification, the worse its reputation.

Unrelated diversification may also make evaluation difficult and ambiguous by reducing the credibility and effectiveness of corporate information and advertising. Unrelated diversification obscures divisional contributions to corporate profitability, making external assessments of activities tentative. Moreover, the trend toward takeovers and "deconglomeration" in the mid-1980s may have made unrelated diversifiers even more suspect to constituents (Galambos & Pratt, 1988). Since achieving synergistic relationships across unrelated businesses is a daunting task requiring the constant transfer of capital and know-how, we suggest that, lacking detailed and credible information about divisions, publics may be driven to rely on a broader set of signals in assessing firms with high levels of unrelated diversification.

> Hypothesis 14: The determinants of reputation are more varied for unrelated diversifiers than for focused firms.

DATA AND METHODS

The 292 firms included in *Fortune's* 1985 study of corporate reputation constituted the set of firms for this analysis. The *Fortune* survey, which solicited ratings of corporate excellence from 8,000 executives, outside directors, and securities analysts, had a 50 percent response rate (Hutton,

1986: 16–18). Respondents did not rate all the firms; they rated only those in their own industry or economic sector. Firms were rated relative to their principal competitors on eight attributes of reputation. We obtained summary data for the 1985 *Fortune* study from Erdos and Morgan, New York, the firm that conducted the study.

Accounting data for these firms were obtained from Standard and Poor's COMPUSTAT industrial and business segment tapes, which include accounting information regularly reported by public firms to the Securities and Exchange Commission (SEC). Data were selected for the end of fiscal 1984 and represent the most highly publicized accounting information available to respondents at the time they were surveyed.

Market performance and institutional ownership data came from the *O'Neill Datagraphs* (William O'Neill and Company, Inc., 1985). Data on media citations throughout 1985 came from the *Business Periodical Index* (H. W. Wilson Company, 1986). We obtained data on 1984 charitable contributions from the *Taft Corporate Giving Directory* (Taft Group, Inc., 1986), the *Corporate Foundation Profiles* (Foundation Center, 1986), and *Corporate 500: The Directory of Corporate Philanthropy* (Public Management Institute, 1986). Data on foundations were coded from *The Foundation Directory* (Foundation Research Center, 1985).

COMPUSTAT data for regularly reported variables were not available for all 292 firms *Fortune* reported on, resulting in the loss of 23 firms because of missing data or post-1984 mergers, acquisitions, and divestitures. We referred to the 269 remaining firms as group 1. The inclusion of advertising expenditures—data not regularly reported to the SEC—and charitable contributions further reduced the study set to 157 firms (group 2). Use of models including diversification data further reduced the set under investigation to 119 firms (group 3).[5]

Representativeness

Since both the survey design and missing values made the final set of firms nonrandom, we investigated the extent to which the two subsets, groups 2 and 3, were representative of the *Fortune* sample (group 1). Firms included in group 2 differed significantly from excluded firms on sales, income, and number of employees. When these variables were standardized to sector means and standard deviations, the only significant difference was in 1984 sales ($p < .01$). The results of t-tests on group 3 firms showed that they had no significant differences from group 2 firms but had significant differences in size (measured as sales and income) from firms excluded from group 3. These differences remained after we had controlled for sector ef-

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[5] The number of firms in groups 2 and 3 actually used in the analyses reported in Table 3 were further reduced to 154 and 115, respectively, because of missing values on firms' risk for which complete data were required for 1975–83.

fects. Excluded firms did not, however, differ significantly from included firms in either group 2 or group 3 on the key independent variables used in the analyses.[6]

To check that included firms were representative of the original set, we derived three regression models of reputation using three predictor variables for which we had complete data: profitability, size, and visibility. The first model was based on group 2 firms, the second on firms excluded by missing values from group 2, and the third on pooling the two sets of firms to reconstitute group 1.

All three models were nearly identical in the size and direction of their beta coefficients and explained 27–35 percent of the variation in reputation. A Chow test showed no significant difference between included and excluded firms ($F_{3,272} = 2.08$, $p > .10$). We calculated differences between predicted values for each pair of models and found them to be normally distributed around a mean of zero. There was therefore no reason to suspect that the form of the relationship between variables would be different for excluded firms than for included firms because of missing data on predictor variables.

Measures

Corporate reputation. The dependent variable was reputation, an index formed from ratings respondents provided on eight 11-point scales (0 = poor, 10 = excellent) to the *Fortune* survey, which was conducted between September and December of 1985.[7] The survey began by asking respondents to name the leading firms in an economic sector and continued: "How would you rate these companies on each of the following attributes: quality of management; quality of products or services; long-term investment value; innovativeness; financial soundness; ability to attract, develop, and keep talented people; community and environmental responsibility; and use of corporate assets?"

Previous studies using *Fortune*'s ratings have relied on single dimensions and typically investigated either the correlates of one dimension of reputation or its consequences. For example, McGuire, Sundgren, and Schneeweis (1988), Conine and Madden (1985), and Chakravarthy (1986) all investigated social responsibility. The pattern of correlations among these

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[6] Differences between included and excluded firms reflect the fact that smaller and less profitable firms do not advertise as much or give as much to charity as larger, more profitable firms do. However, this fact did not prevent our generalizing from the results of analyses of included firms to excluded firms.

[7] *Fortune* declines to specify the exact time during which the survey was conducted. Since they announced the study in August 1985 and provided summary results in January 1986, we concluded that all questionnaires were filled out during the last quarter (September–December) of 1985. All market measures used in this study were therefore estimated for September 27, 1985.

dimensions suggests that this is not a valid approach since they are not conceptually distinct and demonstrate considerable empirical relatedness.

To overcome the limitations of analyzing separate dimensions of reputation, we created an index of overall reputation from the eight single dimensions (α = .97). A varimax factor analysis of the eight attributes extracted a single factor with an eigenvalue of 6.68 that accounted for 84 percent of the variance. Factor analyses of other surveys conducted by *Fortune* in the last quarters of 1982, 1983, 1984, and 1986 supported the stability of this factor solution and justified our conclusion that the eight attributes elicited from respondents were components of an underlying and stable construct of reputation. We adjusted overall reputation for sector differences since the *Fortune* survey asked people to assess firms' reputations in comparison to those of other firms competing in the same primary sector. We also used the three additional scores for reputations at the end of calendar years 1982, 1983, and 1984 in a cross-sectional time series model.

Sector. All variables in the analyses reported below were normalized with respect to the means and standard deviations of the economic sectors defined in *Fortune*. These sectors are similar, though not identical, to two-digit Standard Industrial Classification codes and represent the primary economic involvements of firms in the study.[8] Normalization by these sectors, though imperfect, makes firms roughly equivalent in terms of primary economic or historical commitments and is especially justified because the *Fortune* survey asked respondents to rate firms relative to other firms in the same primary sector (Hutton, 1986: 16–18).

Size. Size was computed as a logarithmic transformation of total sales in 1984.

Economic performance. Economic performance was gauged in three ways: (1) by prior-year accounting profitability, measured as return on invested capital (ROIC) at the end of fiscal year 1984, a measure that is independent of capital structure (Nathanson, 1980); (2) by the ratio of market to book value (for September 27, 1985), a measure that captured market value just prior to the assessments of firms' reputations in fall 1985; and (3) by the yield, for September 27, 1985, a ratio of the prior four quarters' dividends divided by share price on that date.

Riskiness. The level of accounting risk in 1984 was estimated by the coefficient of variation (the ratio of the standard deviation to the mean) of ROIC in the previous nine years, 1975–83 (Martin & Gray, 1971). A market measure of risk was gauged by firms' beta coefficients on September 27, 1985. Beta coefficients are commonly used measures of the systematic risk of a firm—the degree to which movement in a firm's stock is associated with general stock market movements.

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[8] We use the term "sector" to distinguish these domains of economic activity from "industry," a term increasingly applied to business-level activity at the four-digit SIC code level.

Institutional ownership. The concentration of a firm's stock in institutional hands was estimated as a variable called institutional ownership, representing the percentage of all outstanding shares held on September 27, 1985, by banks, insurance companies, and mutual funds.

Media exposure. Media visibility was estimated as the total number of articles written about a firm in 1985, the calendar period most closely matching the period during which this survey's respondents would have formed their individual judgments of firms. We included the full year because of uncertainty about the actual timing of survey responses. We also tabulated the month-to-month distribution of articles for a 10 percent random sample of firms to check for bias in the timing of articles during the year. Although there was variation for individual firms, the aggregate distribution of articles throughout the year was not significantly different from the distribution of a random sample drawn from a uniform distribution ($t = 1.4$, $p > .20$), suggesting that there would be no systematic bias from using the full year of news reports. The resulting indicator was adjusted for both sector and size effects because we expected variations in the firms' sizes to skew the distribution of media citations and expected differences in coverage between sectors. A rater then content-analyzed the titles of the 15,400 articles found and classified each as indicating either positive or negative news about a firm.[9] Announcements concerning performance, new products, or a new CEO were "good" news, and news about crises, regulation, or federal investigation was "bad." To check the reliability of the index, three raters independently rated a 10 percent subset of the articles (2,132 titles); agreement with the principal rater was high, with a .88 coefficient of reliability. We therefore created a favorability index, calculating the degree to which media reports were not negative as the proportion of positive and neutral ratings received.

Differentiation. A firm's total advertising expenditures in 1984, adjusted for firm size, was the measure of advertising intensity. We estimated a firm's charitable contributions during 1984, adjusted for firm size,[10] for the measure "charity." A dummy variable called foundation was used to distinguish between firms that had a separately endowed foundation in 1984 through which they funneled charitable contributions and those with no such foundation.

Diversification. COMPUSTAT's business segment tape provides data on firms' annual sales by segment, a business domain that can encompass both

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[9] We considered coding a "neutral" category but found it less reliable than "positive" and "negative." Raters tended to either over- or underuse the neutral category. Very few items proved difficult to code into the more restrictive categorization, and those were eliminated.

[10] We also tried adjusting charitable donations for net income rather than total sales to account for the possibility that firms might use different rules of thumb in budgeting resources to advertising (total sales) and to charitable causes (prior net income) (Burt, 1983). The results were similar to those with the reported variable.

four- and two-digit SIC code levels. Up to 2 four-digit codes are reported for each segment. From these data, we created a continuous Herfindahl-type[11] measure of diversification across segments at the end of fiscal year 1985, calculated as $1 - (\sum_j \text{Sales}_j^2)/(\sum_j \text{Sales}_j)^2$, where j = the number of segments.

As Montgomery (1982) showed, this measure is highly correlated with Rumelt's (1974) categorical measure of relatedness, so firms with high scores on the index are more likely to encompass less related businesses under their corporate umbrellas than firms with low scores on the index. However, the COMPUSTAT data base does not report the exact percentage of segment sales in each four-digit business. To better account for relatedness, we therefore assigned segment-level sales equally to distinct four-digit industries only when they did not fall under the umbrella of the same two-digit sector (Amit & Livnat, 1988; Wally, 1989).

Analyses

Table 1 presents the basic descriptive statistics for all the independent variables incorporated in the analyses and the intercorrelations among these variables after adjustment for economic sector. The low intercorrelations among adjusted predictor variables used in the models gave us no reason to suspect multicollinearity, and various diagnostic tests run on derived regression models confirmed that it was not a problem.

The analyses were carried out in three steps, the first of which was calculation of a cross-sectional time series model that explains reputation in terms of four signals derived from prior-year accounting data.

Second, we modeled market measures as a function of prior-year accounting information. Since market measures already embody publicly available information about firms, we created standardized residual scores for the market-book ratio, beta, yield, and visibility, the only variables for which prior-year accounting data had strong effects. The residual scores ensured the independence of those variables from profitability, risk, advertising, and size and represented the information remaining in the variables after the influence of previously distributed, readily available accounting information had been removed. We then incorporated these residuals into models of corporate reputation designed to test the hypothesized relationships presented in Figure 1.

Third, to investigate the effects of informational signals on the reputations of firms with differing levels of diversity, we split the subset of firms for which diversification level could be calculated at the median value of their ratings on that variable. We created the two groups to see if publics rely on different informational signals in constructing the reputations of diversified firms of greater or lesser relatedness.

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[11] For a detailed discussion of Herfindahl-type and related entropy measures, see Amit and Livnat (1988).

TABLE 1
Descriptive Statistics[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Reputation	6.33	0.90													
2. Profitability	0.10	0.08	.44												
3. Risk	0.09	0.65	-.39	-.12											
4. Advertising	0.03	0.03	.27	.20	-.10										
5. Size	8.31	0.90	.22	.05	-.06	.28									
6. Institutional ownership	0.28	0.08	.24	.12	-.10	-.07	-.05								
7. Market-book ratio	1.76	0.95	.49	.48	-.26	.16	-.05	.05							
8. Beta	1.07	0.39	-.28	-.23	.17	-.31	-.30	.06	-.29						
9. Yield	0.35	0.16	.00	.01	-.20	.12	.28	-.07	-.15	-.17					
10. Visibility	0.02	0.01	-.26	-.18	.07	-.03	-.18	.02	.00	.07	-.04				
11. Favorability	0.87	0.18	.31	.15	-.05	.03	.11	.16	.26	-.04	.08	-.34			
12. Charity	0.01	0.01	.18	.05	-.01	.15	.03	.09	.02	-.17	.03	.01	.23		
13. Foundation	0.74	0.47	.17	.12	.01	.09	.00	-.03	.00	.01	.11	-.15	.04	.03	
14. Diversification	0.47	0.25	-.24	-.15	-.03	-.01	.09	-.04	.02	-.07	.29	-.06	.04	.04	-.04

[a] All means and standard deviations shown are prior to standardization by sector. $N = 154$, except for correlations with diversification, for which $N = 115$.

[b] All correlation coefficients greater than .1 are significant at $p < .05$.

RESULTS

Through a two-way cross-tabulation of firms by their median scores on reputation and accounting profitability after adjustment for sector, we classified 51 firms as either low reputation–high profitability or high reputation–low profitability. Together, these categories represented 30 percent of the firms under study, and noneconomic informational cues appeared particularly relevant to explaining their reputations. Despite the firms' relatively high profitability, for instance, publics assigned worse reputations to such diverse firms as Pepsico, Polaroid, and RCA, suggesting that constituents are judging the prospects of these firms on other than accounting profitability. Similarly, firms like Eastman Kodak, Merrill Lynch, General Electric, Texas Instruments, and Gencorp enjoyed better reputations than their profitability levels would warrant. On what basis did constituents form judgments of these firms' prospects? To address this question requires multivariate models that incorporate more than accounting profitability as a predictor of reputation.

Cross-sectional Time Series

The influence of four variables for which we had complete data on the three-year time series of corporate reputations for the ends of fiscal years 1982, 1983, and 1984 were first investigated. Those data provide a first-order test of the influence that accounting signals have on constituents' assessments of reputation. Table 2 presents the standardized model.

The cross-sectional time series analysis on 557 firm-years indicates basic support for Hypotheses 4, 5, 11, and 12. As expected, assessments of reputation appear to be positively related to prior accounting profitability, advertising intensity, and size and negatively related to prior performance-adjusted risk. Although the pooling of firm-years violates the least-squares

TABLE 2
Cross-sectional Time Series Analysis of Corporate Reputation, 1982–84[a]

Independent Variables	Adjusted Reputation
Profitability	.42***
Risk	−.21***
Advertising	.10**
Size	.17***
Adjusted R^2	.30***
df	4,552
F	21.45

[a] The independent variables were calculated for the year before the year of data collection; reputation is for the year of data collection.

** $p < .01$

*** $p < .001$

assumption of independence, a Durbin-Watson statistic of 1.94 suggests that autocorrelation did not seriously affect the stability of the model ($p < .01$).

Regression Models

To investigate the joint influence of both prior accounting information and current market and institutional signals on publics' assessments, we calculated various models that assess the influence of residual scores for the market-book ratio, beta, yield, and visibility against other informational signals. Table 3 presents results for these models.

Model 1 confirms the results of the cross-sectional time series analysis and provides significant support for Hypotheses 4, 5, 11, and 12, relating accounting signals to publics' assessments of firms. Profitability, advertising intensity, and size positively influence assessments of reputation, and accounting risk has a strong negative effect.

Hypotheses 1 and 3 were also supported. After residuals had been cal-

TABLE 3
Explaining Corporate Reputation in 1985[a]

Independent Variables	Models[b]			
	1: All Firms	2: All Firms	3: Low Diversity	4: High Diversity
Profitability	.33***	.21***	.27**	.21**
Risk	−.30***	−.40***	−.31**	−.41***
Advertising	.11†	.17**	.33**	.10
Size	.15**	.12**	.07	.25**
Institutional ownership	.18**	.11†	.20*	.07
Market-book ratio[c]	.23***	.29***	.31**	.19*
Yield[c]	−.17**	−.13†	−.07	−.27**
Visibility[c]	−.20***	−.15*	−.03	−.26**
Beta[c]	−.07	.10	−.17†	−.03
Favorability	.04	.03	.03	.20*
Favorability × visibility	.05	.07	.03	.25**
Charity	.10†	.07	.08	.03
Foundations	.15**	.13*	.10	.14†
Diversification		−.24***		
Adjusted R^2	.51	.53	.46	.63
df	12,134	14,100	13,44	13,43
F	13.46***	10.55***	4.83***	9.21***

[a] Beta coefficients are shown.

[b] For model 1, $N = 148$; for model 2, $N = 115$; for model 3, $N = 57$; and for model 4, $N = 58$.

[c] This is a residual variable calculated from regressions against profitability, risk, size, and advertising.

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

culated, both the market-book ratio and dividend yield provide additional information and significantly influence constituents' evaluations: high market-book ratios and low dividend yields induce constituents to assign high reputations to firms over and beyond the effects of accounting profitability, advertising intensity, size, and risk. The data did not, however, support Hypothesis 2. Residual information embodied in firms' beta coefficients does not appear to influence reputations.

Hypothesis 6 predicts that institutional ownership will positively affect reputations. Model 1 corroborates the hypothesis that publics tend to assign higher reputations to firms with a high proportion of stock held by banks, insurance companies, and mutual funds.

Hypotheses 8–10 propose that firms' exposure through the media will significantly influence reputational judgments. The results indicate that residual visibility negatively influences reputations, refuting Hypothesis 8: With size controlled, model 1 suggests that the higher a firms' visibility per unit of sales and hence the greater the scrutiny of the firm by the press, the worse its reputation. Contrary to expectations, model 1 also fails to provide support for Hypothesis 9, stating that the greater the volume of nonnegative coverage, the better a firm's reputation. Nor does there appear to be any interaction between nonnegative coverage and the intensity of scrutiny of firms by the media, as Hypothesis 10 proposes.

Figure 1 suggested that firms' responsiveness to social concerns would positively influence publics' assessments. The significance of the beta coefficients for the charity and foundation variables support Hypothesis 7: Publics assign higher reputations to firms that have foundations and give proportionally more to charity than other firms.

Altogether, the results of model 1 provide significant support for the hypotheses shown in Figure 1. The strengths of the variables' contributions to explained variance can be examined by comparing the beta coefficients. In descending order of importance, they are: (1) accounting signals of profitability and risk, (2) market valuation, (3) media visibility, (4) dividend yield, (5) size of firm, and (6) boundary-spanning through foundations, charitable contributions, and advertising.

Diversification

In model 2, we added the Herfindahl measure of firm diversification to model 1. The results indicate that diversification tends to negatively influence publics' assessments of reputation, supporting Hypothesis 13. Since the beta coefficients of the other variables change, however, model 2 suggests that publics may draw on different informational inputs in constructing the reputations of firms of various levels of diversification. To examine the signals used in constructing these reputations, we calculated models 3 and 4, which present the results of model 2 broken out at the median value of diversification. Following Montgomery (1982), we assumed that firms with low diversification tended to be more focused and that firms with high diversification were involved in a broad range of businesses.

A Chow-test comparison of models 3 and 4 suggests that breaking out by degree of diversification improves upon model 1 ($F_{13,85}$ = 2.67, p < .01). To further test for significant differences between firms of low and high diversity, we computed a set of moderator regression models by introducing interactions of each variable with diversification. Diversification only significantly moderated the effects on reputation of media visibility (p = .09), nonnegative media appraisals (p = .03), the interaction of visibility with those appraisals (p = .002), size (p = .11), and dividend yield (p = .15), with the last two effects relatively weak. Given this pattern and the results of models 3 and 4, the results appear consistent with Hypothesis 14: Publics appear to rely on different criteria and a broader range of informational inputs to assess the reputations of diversified firms than they use to interpret the activities of focused firms.

DISCUSSION

Economists have proposed dynamic models to explain why firms invest in reputation building (Weigelt & Camerer, 1988; Wilson, 1985). They have neglected to consider, however, the institutional context within which reputations develop. In this study, we emphasized the social community within which firms themselves are embedded and the central role played by firms, constituents, and the media in influencing the informational context within which reputational judgments are made. Economists may benefit from accommodating such an institutional understanding of corporate reputations in their game-theoretic models.

The results of this study support an understanding of firms as involved in a competitive market for reputational status in which, because of informational asymmetries, firms signal their key characteristics to constituents. Consistent with the logic of Figure 1, our findings show that publics appear to construct reputations from a mix of signals derived from accounting and market information, media reports, and other noneconomic cues. Firms' risk-return profiles, resource allocations, social responsiveness, institutional ownership, media exposure, and corporate diversification postures signal constituents about firms' prospects and generate reputations.

The analyses confirmed our suspicion that a limited bivariate analysis linking short-term profitability to reputation would be misleading: The multivariate models suggest that historical performance and other noneconomic cues also influence reputations, and that must be true particularly for the 51 firms for which reputations and short-term profitability were out of line.

A broad range of economic and noneconomic signals emanating from firms help predict publics' reputational orderings within sectors. Most significantly, and as expected, accounting measures of profitability and risk and market value most strongly affected judgments of firms. Also important, however, were firms' reflected visibility in the media, the extent to which institutions held their stock, their dividend yield to investors, and their demonstrations of social concern.

If managers can strongly influence reputational assessments by involving themselves in boundary-spanning activities with consumers, investors, and society at large, it is also true that the actions of institutional investors and media accounts heavily condition their firms' reputations. Banks, insurance companies, and, increasingly, investment funds occupy central positions in the economy (Mintz & Schwartz, 1985). Our results suggest that by purchasing a firm's equity in capital markets, institutional investors signal constituents about the merits of the firm's activities. Since these signals are incorporated into constituents' reputational assessments, they may constitute a path through which institutional investment patterns influence managers themselves and possibly alter competitive dynamics in industries.

The finding that intensive media scrutiny has a strong negative effect on firms' reputations was surprising, particularly since it did not matter whether those ratings were favorable or unfavorable, except for diversified firms, for which nonnegative press improved reputation. We suggest three explanations: (1) media reporters deem newsworthy only events that impugn corporate managements, (2) external publics react negatively to all forms of publicity, and (3) only negatively predisposed evaluators rely on media accounts of firms.

However, since this study's coder rated an average of 87 percent of the article titles analyzed as not negative, the business media do not appear to be predominantly negative in their reviews of firms. Moreover, a scan of selected news reports indicated that detailed accounts varied widely in tone, making them inherently ambiguous informational vehicles. Finally, it seems difficult to defend the view that evaluators who rely on media-generated signals are inherently negative.

The data in Table 3 demonstrate the interaction of diversification with media exposure. Since media visibility, the extent of nonnegative coverage, and the interaction of visibility and nonnegative coverage do not influence publics' assessments of focused firms but are all significant for diversified firms, we propose that constituents rely on media accounts in the absence of confidence in firm-generated data. Since benefits only accrue to diversified firms at the cost of increased complexity (Montgomery, 1985), it may be that publics turn to the media because information is either too difficult to obtain from these firms directly or is seen as unreliable when it is so obtained.

More broadly, the influence of diversification on the reputation-building models suggests that publics draw on different and fewer sources of information in making judgments about focused firms than they do when making judgments about diversified firms. Diversification itself appears to encourage publics to broaden their search for information when constructing their assessments. In contrast, the publics of focused firms construct their judgments principally from accounting and market measures of both performance and risk, institutional ownership patterns, and advertising (Milgrom & Roberts, 1986a). We therefore speculate that focused firms appear more easily interpretable to evaluators, making economic signals less ambiguous

and their reputations less susceptible to influence by the media and other external monitors.

CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

This study made a preliminary attempt to fuse economic and sociological approaches to the study of firms' interactions with their publics. Little previous empirical research has viewed firms as involved in a competitive market for reputational status. Yet, the judgments of publics collectively create reputations that stratify industries, with potentially significant competitive advantages accruing to firms with higher perceived reputational status (Caves & Porter, 1977; Weigelt & Camerer, 1988). This study demonstrated how students of strategy might benefit from investigating the informational bedrock upon which firms' reputations rest.

Future research should attempt to specify the particular interpretive process through which firms' investments become cognitions in the minds of individual constituents, whether based on product and image advertising or on firms' internal commitments of funds to R&D or their labor force. Firms actively intrude into their environments, not only through resource deployments (Pfeffer & Salancik, 1978), but also through social networks (Laumann & Knoke, 1987; Shrum & Wuthnow, 1988) and carefully disseminated self-presentations like annual reports (Ryan et al., 1987; Salancik & Meindl, 1984). Much as employees in organizations invest in activities to win promotions, so may organizations invest in activities that afford them good marks in interorganizational fields (DiMaggio & Powell, 1983). Students of strategy should appreciate how firms' actions intertwine with those of rivals through elaborate networks of constituents to create a distinct social collectivity with emergent properties (Fombrun, 1986).

Methodologically, researchers should attend to the longitudinal process through which reputations attain stability and structure. Yearly budget allocations do not in and of themselves generate stable reputations; rather, the cumulative investments that firms consistently make in different domains over long time spans are more likely to influence the cognitive interpretations of stakeholders. Although it may be reasonable to assume—as we did in this study—that the yearly budgets of large firms are highly correlated with their long-term total investments, future research could directly assess these cumulative investments. Like electromagnetic signals, reputations may have a long-term component that reflects cumulative investments. Short-term noise may, however, obstruct the transmission if cross-sectional analyses are relied upon. Even if reputations reflect long-term status orderings, they can change as a result of short-term actions, whether intentional or accidental. Separating the short- and long-term components of reputational signals should be the subject of much future debate in the analysis of corporate reputation building.

Another direction for future research lies in better specifying the dimensionality of the construct: Do firms have one reputation or many? Do repu-

tations significantly differ by either domain or audience? This study assumed a single underlying construct of reputation produced by aggregating findings across multiple domains. Factor analyses of the *Fortune* data we used here and the similarity of the respondents in the study to other audiences firms confront supported that assumption. A more extensive study of reputation might enrich our understanding of the construct by including other audiences with which firms interact, such as consumers and employees. Incorporating more domain-specific components might make it possible to distinguish central and peripheral influences on firms' reputations.

Although cash disbursements had considerable signaling value for the publics' studied, future research might also consider if short-term jolts such as CEO successions, mergers, acquisitions, joint ventures, and new product developments affect reputations in the way they affect stock market behavior. Corporate catastrophes like Union Carbide's 1985 Bhopal accident and the failure of Continental Illinois in 1984 undoubtedly damage reputations. How long-lived are these effects? Does competent handling of crises dampen their negative effects? Johnson and Johnson's successful turnaround of the Tylenol crisis in 1984 suggests that competent handling may well moderate the reputational effects of environmental jolts.

Finally, analyses of the consequences of established reputations—and major changes in reputations—for competitive dynamics in an industry are needed to complement this research. Positive reputations are often said to attract investors, lower the cost of capital, and enhance the competitive ability of firms. Managers may strive to enhance employee welfare, not only to increase the likelihood of compliance with directives, but also to signal potential workers about working conditions and internal norms (Kreps & Spence, 1985; Spence, 1974). In turn, firms that develop reputations for attending to employee welfare may find themselves in a good bargaining position in labor markets, attract better applicants, and achieve lower costs (Stigler, 1962). However, few empirical studies have actually demonstrated these effects, probably because, as we have argued, a firm's acquired reputation is only likely to affect performance marginally. Investigating reputation's influence requires a fully articulated model of organizational performance that also acknowledges the effects of market, product, and strategy variables. To tease out the marginal effect of reputation on performance would therefore require extending the present analyses over time and developing, in tandem with surveys like *Fortune's*, a data base of strategic, market, and environmental variables that would allow the matching of changes in reputation with changes in underlying influents and thus enable the modeling of joint consequences.

If reputations confer competitive advantage, they constitute important barriers to firms' mobility within industries and into related or unrelated industries. How resilient are reputations, how sound an investment, how much of an asset? To identify the effects of reputation on mobility, competitiveness, and ultimately, on performance, is a formidable and potentially rewarding research challenge.

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STRATEGY, CONTROL SYSTEMS, AND RESOURCE SHARING: EFFECTS ON BUSINESS-UNIT PERFORMANCE

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Focusing on business units (SBUs) in diversified firms, this study investigated the relationships among control systems, resource sharing, and competitive strategies and their interactive effects on SBU performance. Empirical results indicate that output control and high resource sharing are associated with higher effectiveness for a low-cost strategy and behavior control and high resource sharing are associated with higher effectiveness for a differentiation strategy.

The means by which the senior executives of diversified firms control the behavior of general managers in charge of strategic business units (SBUs) is of concern to both academics and practitioners. Two important variables that senior executives can use to influence an SBU general manager's behavior are the amount of resource sharing between the SBU and other units and the type of control system they maintain over the general manager (Porter, 1985). Focusing on this topic from a contingency perspective, in this article we argue that the level of resource sharing chosen and effective control over the general manager of an SBU are functions of the strategy pursued by that SBU.

Most studies of control systems have embodied either an organizational or an economic approach. Following Eisenhardt (1985), we integrated agency theory and extant organizational research to further our understanding of control system design. Ouchi (1979) argued that in controlling people's work, only two aspects of that work can be observed and monitored: behavior and the outputs[1] that result from behavior. We will introduce a modified model of control systems that incorporates insights from organization theory (Ouchi, 1979) and agency theory (Baiman, 1982) and identifies the antecedent conditions under which behavior control or output control might be appropriate.

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[1] Performance evaluation suggests that some aspect of employee performance is being measured. One aspect that can be measured is the outcome of an employee's behavior. Control on these outcomes results in output control.

Prior research has suggested three important relevant relationships: (1) the strategy chosen by an SBU influences the type of control chosen (Govindarajan, 1988), (2) the utility of resource sharing among SBUs depends on their strategic contexts (Porter, 1985), and (3) the degree of that resource sharing affects the choice of controls (Pitts, 1980; Vancil, 1980). We tried to integrate these three relationships in the context of contrasting behavior and outcome controls. The theoretical framework for this study is a hypothesized three-way interaction among control systems, resource sharing, and SBU strategy, with a resultant effect on SBU performance.

This study was designed to make several contributions to the control and strategy literatures. First, our modified integrative model of control systems extends the research of Ouchi (1979) and Eisenhardt (1985) to the level of research on general managers. Second, we explored a three-way interaction of controls, resource sharing, and strategy that implies that the effectiveness of any one factor is affected by the level of the other two factors. The selection of a strategy affects the implementation of that strategy, and further, the factors that are being implemented—in this case, controls and resource sharing—need to be consistent with each other. Finally, we hope this article will add to the emerging literature on strategy implementation at the business-unit level by building on and extending prior research on differentiating types of executive leadership (Gupta & Govindarajan, 1984) and structures (Govindarajan, 1986a; Miller, 1988 in accordance with business-unit strategies.

THEORETICAL DEVELOPMENT

The control model that is presented in this section is a refinement of Ouchi's (1979) model of control. We incorporated propositions from agency theory and added new antecedent factors in order to better predict effective control.

Organizational Control Framework and Agency Theory: A Synthesis

Recent organizational literature has noted two different approaches to control: performance evaluation and socialization. In performance evaluation, a "signal"[2] from a worker is measured, evaluated, and rewarded. Ouchi (1979) and Baiman (1982) stated that the signal measured can be either the actions of an employee or the outcomes of those actions. Control through socialization, which Ouchi (1981) referred to as clan control, attempts to minimize the divergence of preferences among group members. Following Nelson and Quick (1985), we considered socialization control a form of behavior control.[3]

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[2] The signal is either the measured behavior of the employee or the measured response of the control system to the outcome.

[3] In our empirical data, very few respondents used socialization control. There are at least two explanations for this finding: (1) socialization control is a form of behavior control and is

FIGURE 1
Control Types and Antecedent Conditions[a]

		Task Programmability	
		Perfect	Imperfect
Outcome Measurability	High	1 Behavior or outcome control	3 Outcome control
	Low	2 Behavior control	4 Clan socialization

[a] This model is adapted from Ouchi (1979) and Eisenhardt (1985).

Proponents of agency theory and organization theory have argued that the selection of a control signal depends on the information characteristics of a task environment. Focusing first on organization theory, in Figure 1 we present Eisenhardt's (1985) formulation of Ouchi's (1979) model of the ties between task characteristics and control strategy. According to this model, the levels of two environmental factors, task programmability and outcome measurability, must be assessed to determine the proper control. Task programmability is a task's susceptibility to clear definition of the behaviors needed to perform it. If a task's programmability is perfect, the behaviors needed for its successful performance can be well understood. Eisenhardt (1985) linked task programmability with knowledge of the transformation process, the process whereby employee behaviors generate system outcomes. If knowledge of this process is high, appropriate behavior can be explicitly defined. As such knowledge decreases, behavior control becomes difficult to use because effective behavior cannot be clearly specified.

Output measurability is an output's susceptibility to reliable and valid measurement. If outputs are unobservable or unreliable and thus not good predictors of behavior, output control is not appropriate. If the goals of an organization are not understood or agreed upon, output control is not appropriate (Ouchi 1979). The matrix presented here is normative, not just descriptive, implying that for effective performance, an organization should use the form of control specified.

Agency theory, to which we now turn our attention, concerns finding optimal, profit-maximizing, forms of control (Baiman, 1982). A principal attempts to control an agent in order to maximize the former's utility. The typical principal-agent model assumes that agents are risk-averse and that having them assume risk is costly to principals. An agent assumes risk when

properly classified under this category (Nelson & Quick, 1985) and (2) since monitoring systems can make output, or behavior, observable, organizations rarely rely exclusively on socialization control. We deleted data from the few respondents indicating use of socialization control, but results were the same as if these respondents had been coded as using behavior control.

control is based on a stochastic process. For example, when control of agents is based on outcomes, the agents bear risk ɔecause their behavior may be only one factor influencing outcomes undeɹ conditions of uncertainty. In agency theory, as in organizational control theory, agents can be controlled on the basis of their behavior or of outcomes. However, the two theories focus on different antecedent conditions. If an agent's behavior is observable, a principal can specify desired behaviɔr to maximize the principal's utility. This paradigm, the "first-best solutioɹ" (Baiman, 1982: 163), implies no risk for the agent. In the agency theory paɹadigm, principals should base control on observable behavior. However, mɔst of the research that has been done on agency theory has resulted from tɔe assumption that an agent's behavior is unobservable under conditions of high uncertainty. Organization theory predicts that principals will use outcome control when task programmability is low—in other words, when uncertainty is high[4]—assuming outcomes can be measured (Ouchi, 1979). Agenɔy theorists have argued, however, that outcome control in the face of uncertainty transfers risk to agents since outcomes are a function of agents' actions and the "state of nature" (Baiman, 1982: 164). Good outcomes can result despite poor efforts and poor outcomes can result despite good efforts. Accɔrding to agency theory, under conditions of uncertainty principals can still employ behavior control by purchasing information about agents' behaviors through investing in accounting and information systems. Thus, agency theory clarifies the notion of measurability by distinguishing between tɔe measurability inherent in a task and the measurability provided by information systems. If behavior is unobservable, principals will employ outcome control only when the cost of measuring behavior exceeds the cost of transferring risk to their agents.

In summary, in contrast to organization theory, agency theory allows for the possibility of behavior control in cells 3 ɛnd 4 in Figure 1 by positing a role for information systems in implementing behavior control when information about agents' behavior is incomplete. Thus, the integration of organization and agency perspectives permits insights into control that are not possible if the theories are taken alone.

To predict the effectiveness of different forms of control better and to develop our theoretical arguments, we modified Ouchi's model by inserting behavior's observability, a key variable from agency theory. Figure 2 displays the modified matrix, in which the antecedent factors of control type are the observability of outcomes and behavior, and task programmability.

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[4] Task programmability, implying that the link between means and ends can be known (Thompson, 1967), and environmental uncertainty, or uncertainty in a task environment (Lawrence & Lorsch, 1967), are conceptually distinct. However, at the SBU level of analysis, these two concepts are very likely to be highly correlated. An SBU is forced to interface with its external environment to sell its goods or service. The ends the SBU tie directly to the outside environment. If the task environment of the SBU is uncertain, it follows that task programmability for the SBU is also imperfect.

FIGURE 2
Control Types and Antecedents, Modified Model

		Task Programmability	
		Perfect	Imperfect
High outcome observability	High behavior observability	1 Output or behavior control	5 Behavior control
	Low behavior observability	2 Output control	6 Output control
Low outcome observability	High behavior observability	3 Behavior control	7 Behavior control
	Low behavior observability	4 Behavior control	8 Behavior control

These factors are typically continuous. However, for ease of exposition, we present a dichotomous model.

Outcome measurability, behavior measurability, and task programmability appear in each cell in Figure 2. In cells 1 through 4, task programmability is perfect, so the determination of output reveals behavior and the determination of behavior reveals output, and agents assume no risk. Therefore, to minimize risk, the more observable signal should be the basis for selecting a control system. In cell 1, both behavior and output are observable, so either output or behavior control could be effective. In practice, organizations rarely encounter such conditions since it is costly to observe redundant control signals. Cell 2 represents high output and low behavior observability and cell 3 shows the reverse. Control should again be based on degree of observability. Cell 4 represents low observability on both dimensions. Ouchi (1977) argued that when observability on both dimensions is low, socialization, or behavior, control should be used.

The second set of four cells all represent conditions in which task programmability is imperfect; one-to-one mapping between behavior and output is lacking. Thus, agents bear risk if output control is employed. The conditions in cell 5 (high, high, imperfect) imply that behavior control is appropriate because risk will not be placed on agents. In cell 6, control is achieved through output control, but as output does not perfectly correlate with behavior, agents bear risk. For cell 7, behavior control is appropriate. Finally, as was previously discussed, the final cell shows the characteristics of a situation in which socialization, or behavior, control is the desirable approach (Ouchi, 1979).

Control and Strategy

For a strategy typology, we used Porter's (1980) framework containing two opposite types: the low-cost strategy and the differentiation strategy. Porter (1980, 1985) describes the following as characteristics of businesses with a low-cost strategy: (1) vigorously pursuing cost reduction, (2) employing people with high levels of experience and practicing all possible economies of scale, (3) acquiring process engineering skills, or the skills needed in order to design an efficient plant, (4) routinizing the task environment, and (5) producing a standard, undifferentiated product. A standard product with a routine task environment implies that the knowledge of ends and means is relatively high, which indicates high task programmability.

As Porter pointed out (1980: 35), the primary focus of an SBU with a low-cost strategy is cost control. The incentives motivating the general manager of such an SBU are typically based on these cost measures. Since costs are typically easily determined, a manager's output is observable. Thus, a low-cost SBU's general manager faces the conditions displayed in cells 1 and 2 of Figure 2. As discussed previously, the cell 1 conditions would not usually be encountered in practice. Since outcome is observable under the low-cost strategy, organizations will not typically incur expenses to make behavior observable. With the factors shown in cell 2 prevailing, an organization would use output control for maximum effectiveness.

Firms pursuing a differentiation strategy attempt to produce a product that is considered unique. In general, in producing a unique product, knowledge of means and ends is low, so by definition, the task of producing and marketing a unique product implies low task programmability. Recent research indicating that the task environment of a differentiation SBU is more uncertain than that of a low-cost SBU further supports this position (Miller, 1988).

Further, the key success factors for a differentiator include creative flair, strong basic research, and product engineering (Porter, 1980: 41). Success in accomplishing these factors defies short-term output measurement on monthly, quarterly, or annual intervals, making output control inappropriate (Ouchi, 1979). Cells 7 and 8 of Figure 2 show the antecedent factors facing differentiation strategists, which argue for the use of behavior control.

In summary, to enhance effectiveness for a low-cost SBU an organization will employ output control, and for a differentiation SBU, it will employ behavior control. Digital Equipment Corporation (DEC) and Data General provide good examples of the interaction between strategy and control system we have discussed (Uttal, 1979: 98–108).[5] DEC follows a differentiation strategy, whereas Data General follows a low-cost strategy. The control systems in these companies differ accordingly. For instance, DEC's sales representatives are on straight salary, but Data General's salesmen receive 50 percent of their pay on a commission basis. As Eisenhardt (1985) argued,

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[5] We would like to thank an anonymous reviewer for pointing this out.

salaried compensation indicates behavior control and commission compen-sation, outcome control. Further, DEC's product managers are primarily evaluated on the basis of the quality of their interaction with their customers (a subjective, behavioral measure), whereas Data General's product managers are evaluated on the basis of results, or profits.

Strategy and Resource Sharing

This section considers the relationship between strategy and resource sharing and their interactive effects on SBU effectiveness. We defined level of resource sharing as the extent to which a focal SBU shares functional activities like marketing, manufacturing, and R&D with other SBUs within a firm. Porter (1985) and Gupta and Govindarajan (1986) noted the possible costs and benefits of resource sharing. The major costs of a high level of resource sharing include the cost of coordinating the SBU groups that share a resource and the cost of reduced flexibility at the individual SBU level. When a resource is shared, an SBU must consult other SBUs before adapting the resource. Therefore, in responding to challenges from competitors, an SBU with high sharing may have limited flexibility.

On the benefits side, high resource sharing may yield a synergistic cost advantage (Gupta & Govindarajan, 1986; Porter, 1985), providing a shared resource at a lower cost than it would have with each SBU producing or acquiring it separately. Such synergy is similar to an economy of scale. In addition, Porter (1985: 330) argued that resource sharing can enhance differentiation by contributing to the uniqueness of an activity and by lowering the cost.

Differences in the strategies of SBUs may lead to differential net benefits from sharing. For low-cost strategists, a high level of resource sharing would be desirable since its scale benefits would directly reduce costs, providing the critical element of this strategy.

The effects of resource sharing on differentiators is not as clear. On the one hand, resource sharing may hinder the flexibility of an SBU that must be creative. Since the task environment is uncertain for a differentiator (Miller, 1988), added flexibility may be needed for reacting to unpredictability. On the other hand, as Porter (1985: 330) noted, resource sharing could benefit an SBU practicing differentiation by contributing to the uniqueness of an activity and by lowering the costs of differentiation, especially in areas in which flexibility is not critical. Therefore, the impact of resource sharing on a differentiation strategy depends on an SBU's specific circumstances.

The way the Dexter Corporation has structured its SBUs illustrates the argument that low-cost SBUs tend to have high resource sharing (Hamermesh, 1979). Its "liquid coatings" SBU, whose central strategic thrust is to be the low-cost producer in its field, shares all the key functions—R&D, manufacturing, and marketing—with three other SBUs. This sharing is intended to facilitate the scale economies in these functions and thereby reduce costs. The Dexter Corporation also provides examples of differentiation SBUs with both low and high levels of resource sharing, which is consistent with our

argument that the relationship between a differentiation strategy and re-source sharing can vary depending on the circumstances. The corporation's "adhesives" SBU pursues a differentiation strategy and is totally self-contained, primarily due to its need for high product-market flexibility. Its "semiconductor molding powder" SBU, which also pursues a differentia-tion strategy, shares the R&D function with three other SBUs to benefit from sharing knowledge on epoxy technology and shares manufacturing plants with two other SBUs to benefit from scale economies in production.

In summary, the benefits of resource sharing are likely to be higher for businesses practicing a low-cost strategy than for those with a differentiation strategy.

Controls and Resource Sharing

This section examines the interaction between resource sharing and control systems. As Ouchi (1979) pointed out, behavior control tends to be subjectively based; a superior using behavior control would base the amount of an SBU manager's bonus on a subjective judgment. At the other extreme, an SBU manager's bonus award might be evaluated on a strict formula-based plan. Since output control is amenable to quantitative measurement, it tends to be formula-based.

Gupta and Govindarajan (1986) noted that reliance on subjective ap-proaches to bonus determination is likely to be more beneficial for SBUs with a high level of resource sharing because the sharing implies that the decisions and actions of other managers in an SBU cluster can affect the performance of the focal SBU. Therefore, for SBUs with high resource shar-ing, formula-based incentive plans strictly tied to quantitative performance criteria are likely to be counterproductive.

It might also be noted that SBUs with high resource sharing would fall in cells 3, 4, 7, or 8 in Figure 2 because they have low output measurabililty, another argument for behavior control.

The control system at the IBM Corporation is a good example of the hypothesized positive relationship between resource sharing and behavior control (Vancil, 1982). The "general products" SBU, which is in charge of mass data storage systems like magnetic tapes and discs, shares a marketing group with other units. Thus, IBM primarily evaluates the general manager of this SBU on the basis of nonfinancial criteria, the important one being whether the products the SBU is developing and making are competitive. IBM senior executives deliberately use behavior control since they cannot measure the contribution of the "general products" SBU to the marketing group quantitatively but must assess it subjectively, using nonfinancial in-dicators.

Three-way Interaction

The basic premise of this research was that an SBU's strategy, control system, and level of resource sharing will interact in determining its perfor-mance. Thus,

> *Hypothesis 1: There will be an interactive effect on SBU performance between the level of resource sharing, control mechanisms, and the strategy employed in an SBU.*

It has already been suggested that low-cost SBUs use output control with high resource sharing. However, high resource sharing is incongruent with output control. Three options exist to deal with this incongruity, each of which has an associated cost. We discuss these options in order of increasing desirability, in terms of cost. The first option is to combine a low-cost strategy, low resource sharing, and output control. This option puts an SBU at a severe cost disadvantage since low resource sharing will make it unable to realize benefits from economies of scale (Gupta & Govindarajan, 1986). The second option, combining low cost, high resource sharing, and behavior control, suffers from two shortcomings: (1) Output is easily observable for a low-cost SBU, but monitoring costs would be incurred in making behavior observable. (2) Behavior control is a subjective process, but the managers of low-cost SBUs need objective, quantitative targets to keep their focus on cost control. The third, preferred, option is to combine a low cost strategy, high resource sharing, and output control, managing the incongruity between output control and resource sharing with carefully written cost allocation schemes. Although implementing and monitoring such schemes is not cost-free, we would expect this cost to be lower than that of switching from output control or high resource sharing. In summary, for low-cost SBUs we expect the benefits of output control and high resource sharing to outweigh the incongruity between these two factors.

> *Hypothesis 2: A combination of a high level of resource sharing and output control will have a positive impact on the effectiveness of SBUs with a low-cost strategy.*

Finally, we have argued that SBUs using a strategy of differentiation should use behavior control to increase effectiveness. Behavior control is in turn congruent with a high level of resource sharing, which might also benefit a differentiation SBU, at least in departments where flexibility is not critical. Thus,

> *Hypothesis 3: A combination of a high level of resource sharing and behavior control will have a positive impact on the effectiveness of SBUs with a differentiation strategy.*

METHODS

Data Sources

Data were collected from SBU general managers at 24 firms on the *Fortune* 500 list. All the firms had headquarters in the Midwest. Constraints on access, time, and funding prevented use of a random sample selected from either the entire *Fortune* 500 or all midwestern firms. Table 1 compares the 24 firms with the *Fortune* 500. The firms studied represented both growing and mature industries, including automotive products, petroleum, food

TABLE 1
Comparative Statistics[a]

| Characteristics | Firms Studied[b] | | | | Fortune 500 | | | |
| | Means | Range | | | Means | Range | | |
		Low	High			Low	High	
Sales	$4.5 billion	$450 million	$37 billion		$3.4 billion	$418 million	$63 billion	
Assets	$2.9 billion	$309 million	$24 billion		$2.7 billion	$87 million	$63 billion	
Employees	40,609	5,900	380,077		28,105	553	601,000	
Return on equity	10%	0.6%	30.7%		10.9%	0.1%	51.1%	

[a] Statistics are for 1983.
[b] $N = 24$.

products, chemical production, aerospace engineering, electronics, consumer durables, clothing manufacture and retail, and various consumer nondurables. Given the size range of the companies studied and the diversity of industries in which they operated, there was no prima facie reason to expect any systematic bias in the findings from business units within these firms.

The chief executive officers of each of the 24 firms designated a contact person, who selected about six SBUs for participation in this study, ensuring that the units represented a mix of strategies and that each general manager had held that position for at least one year. SBU managers received cover letters from the senior researcher and the contact executives explaining the purpose of the study and assuring confidentiality. Managers also received return envelopes for sending completed questionnaires directly back to the senior researcher, to minimize response bias. Of the 145 SBU general managers receiving questionnaires, 134 (93%) responded, and 121 (84%) of the responses were usable. On the average, the respondents were 50 years old, had worked for their present employers for 18 years, and had held their present position for 6 years.

Dependent Measure: SBU Effectiveness

Performance can be measured through objective data or subjective means. Objective performance indicators were of limited value in the context of this research for several reasons. First, it is not possible to use the same set of criteria to evaluate every SBU since, by definition, different SBU strategies imply quite different goals and priorities. At a minimum, we would have needed to attach different weights to various performance criteria, and there is no objective way of deriving such weights. Second, no objective measure can capture some of the factors critical to the success of certain strategies. For instance, success in basic research and product engineering—both key for SBUs practicing differentiation—defy objective, short-term measurement. Third, industry factors influence SBU performance and should be controlled for, but objective performance data for the industry in which an SBU competes may be very difficult to secure.

The above reasoning argues for taking a subjective approach to measuring SBU effectiveness. We adopted the approach suggested by Gupta and Govindarajan (1984), which has two salient features. They measured SBU effectiveness along several dimensions and, to arrive at a measure of overall effectiveness, used the relative importance of each dimension for individual SBUs as weights. They also measured effectiveness by comparing actual performance and a priori expectations rather than measuring it on an absolute scale. Since corporate performance standards for SBUs are likely to take into account the impact of a chosen strategy and industry-related factors, assessing SBU effectiveness relative to corporate standards indirectly controls for the effects of strategic choice and industry factors on performance.

Effectiveness data were collected on ten performance dimensions: return on investment, profit, cash flow from operations, cost control, development of new products, sales volume, market share, market development,

personnel development, and political-public affairs. On each dimension, we asked respondents to rate their SBU's performance relative to corporate standards on a 7-point Likert scale ranging from "significantly below average" to "significantly above average." Next, respondents rated each dimension on a 5-point scale ranging from "not important" to "extremely important" to indicate the degree of importance superiors attached to the criteria when determining the incentive bonus of an SBU manager. Using the data on dimensional importance as weights, we obtained a weighted-average performance index for each SBU. Table 2 contains the descriptive statistics and zero-order correlations among all the variables studied.

As Table 2 shows, effectiveness does not correlate with competitive strategy ($r = -.07$, n.s.), indicating that variations in effectiveness are largely due to intraorganizational factors like control systems rather than to the strategy and industry factors chosen.

Using data collected from each SBU manager's superior,[6] we assessed the convergent validity of the effectiveness index. The correlation between the superiors' and subordinates' responses on the index was positive and significant ($r = .60$, $p < .001$). We also asked each superior to rate, on a 7-point scale ranging from "significantly below average" to "significantly above average," the overall performance of a subordinate's SBU. As expected, the effectiveness index based on the SBU managers' responses correlated positively with the superiors' assessments of overall performance ($r = .54$, $p < .001$).

To test for construct validity, we asked each superior to indicate how the incentive bonus awards received by a focal SBU manager compared with the average incentive bonus awards received by the SBU manager's peers during the same period (7-point scale, ranging from "significantly below average" to "significantly above average"). As anticipated, the effectiveness index correlated positively with superiors' responses on this question ($r = .47$, $p < .001$).

Independent Measures

Competitive strategy. Respondents were asked to indicate the percentage of their business units' current total sales accounted for by products representing use of either Porter's low-cost or differentiation strategy. We described the two strategies as follows. "Overall cost leadership: the dominant focus is to achieve low cost relative to competitors (e.g., Black and Decker in tools)" and "differentiation: the primary focus is to create something that is perceived as unique through superior product features, customer service, brand image, and/or performance (e.g., Mercedes in automobiles)." We assigned an overall cost-leadership strategy a value of -1

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[6] Of the 121 SBU general managers returning usable responses, we had their superiors' names for 88, provided by executives at the parent firms. Effectiveness data were collected from 75 (85%) of these superiors.

TABLE 2
Descriptive Statistics[a]

Variables	Means	s.d.	Minimum	Maximum	1	2	3	4	5	6
1. Effectiveness	4.70	1.03	2.20	6.48						
2. Competitive strategy	0.14	0.60	-1.00	1.00	-.07					
3. Level of resource sharing	16.81	22.90	0.00	100.00	.01	-.18*				
4. Output and behavior control × strategy	0.13	0.62	-1.20	2.00	.13	.57***	-.11			
5. Output and behavior control × resource sharing	15.28	22.82	0.00	100.00	.07	-.11	.12	.12		
6. Strategy × resource sharing	-0.16	18.07	-90.91	49.50	-.01	.64***	-.02	.61***	-.07	
7. Output and behavior control × strategy × resource sharing	0.29	15.21	-65.00	49.50	-.02	.59***	-.04	.64***	-.10	.58***

[a] $N = 116$.
* $p < .05$
** $p < .01$
*** $p < .001$

and gave a differentiation strategy a value of +1. The percentage breakdown an SBU manager provided for each item was then used to construct a weighted-average strategy measure for the manager's SBU. This strategy index is a continuous variable ranging from −1.00 to +1.00.

The construct validity of the strategy var_able was assessed in two ways. First, we asked each SBU's manager its position relative to its leading competitors in the following five areas: product selling price, percent of sales spent on R&D, product quality, brand image, and product features (7-point scale ranging from "significantly lower" to "significantly higher"). In line with the theories and findings of Porter (1980) and Hambrick (1983), the strategy index correlated positively with responses on product selling price ($r = .24$, $p < .01$), percent of sales spent on R&D ($r = .21$, $p < .01$), product quality ($r = .22$, $p < .01$), brand image ($r = .25$, $p < .01$), and product features ($r = .34$, $p < .001$).

Second, each SBU manager was asked tc rate, on a 5-point Likert scale, the importance of 11 competitive methods to the SBU's overall strategy. Bearing out Dess and Davis's (1984) findings, the strategy variable correlated positively with new product development ($r = .25$, $p < .01$) and brand identification ($r = .24$, $p < .01$) but negatively with operating efficiency ($r = −.26$, $p < .01$), low price ($r = −.44$, $p < .001$), and cost reduction ($r = −.29$, $p < .001$).

The convergent validity of the variable was assessed through content analysis of the descriptive parts of the annual report and 10-K form[7] of each company to identify the competitive strategy of each SBU. Codes were 1 for a pure low-cost strategy, 2 for a mixed strategy, and 3 for pure differentiation. As anticipated, the values for the competitive strategy variable obtained from the SBU general managers correlated positively and significantly with the values based on the content analysis ($r = .55$, $p < .001$).

Type of control. Respondents were asked to indicate which one of the following statements, both from Ouchi (1977), most closely reflected their superiors' actual approach to managing their business unit: "Your superior focuses on the attainment of the targets set for your business unit and allows you considerable discretion in deciding the best way of achieving these targets" and "Rather than focusing on the attainment of the desired targets, your superior monitors your decisions and actions on an ongoing basis."

The first statement, representing output control, was coded 1, and the second, representing behavior control, was coded 2.

Level of resource sharing. We expected the degree of resource sharing to vary among the functions of SBUs (Vancil, 1980). Further, we expected the degree of importance of various functions to vary not only within each SBU but also across SBUs (Hitt, Ireland, & Palia, 1982). Following Gupta and

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[7] This is the principal periodic report filed by companies registered under the Securities Acts. Filed annually, form 10-K is divided into two parts: Part I contains information about the registrant and its business; Part II contains financial and related information, including basic financial statements.

Govindarajan (1986), we decided to measure resource sharing as a weighted average across various functions.

Respondents were first asked to indicate the importance of three functions—marketing-sales, manufacturing, and R&D—for the implementation of their SBU's strategy. Next, for each function we asked respondents if their SBU shared resources and, if they answered yes, to what extent it did so. For instance, for the marketing-sales function, respondents were asked whether their SBU shared a common sales force handling the products of several SBUs and to indicate the percentage of the SBU's total sales handled by the common sales force. Using the data on the importance of the three functions as weights, we then derived a weighted-average measure of resource sharing for each SBU.

To assess the construct validity of this measure, we collected data on a 17-item autonomy measure, patterned after Vancil's (1980) instrument, in which values indicated that an SBU's general manager had high decision-making autonomy ($\alpha = .89$). Bearing out Porter (1985) and Vancil (1980), the resource-sharing variable correlated negatively with the SBU autonomy measure ($r = -.24$, $p < .01$).

Data Analysis Techniques

Multiplicative model. Mindful of the arguments of Southwood (1978) and James and Brett (1984) and modeling our approach on those of Schoonhoven (1981) and Govindarajan (1986b), we deemed the most appropriate analytical method for this study to be regression analysis using the following equation:

$$Y = a_1X_1 + a_2X_2 + a_3X_3 + b_1X_1X_2 + b_2X_1X_3 + b_3X_2X_3 + c_1X_1X_2X_3 \quad (1)$$

where

$$\begin{aligned} Y &= \text{effectiveness,} \\ a,b,c &= \text{regression coefficients,} \\ X_1 &= \text{control mechanism,} \\ X_2 &= \text{strategy,} \end{aligned}$$

and

$$X_3 = \text{level of resource sharing.}$$

A significant value for the unstandardized regression coefficient c_1 would support Hypothesis 1. If the three-way interaction term is significant, the effect of any one of the variables depends on the level of the other two variables.

A multiple regression model with cross-product terms rather than an ANOVA was chosen because the latter would have required splitting the data into subgroups. Thus, for continuous variable data like our data on strategy and resource sharing, an ANOVA would have wasted information and been inferior to the multiplicative model.

For interval scale data like all the measured variables in this study, Southwood (1978) and Allison (1977) demonstrated the following: (1) The values and significance levels of the standardized regression coefficients

will change if X_1, X_2, and X_3 are replaced by $X_1 + k_1$, $X_2 + k_2$, and $X_3 + k_3$, where k_1, k_2, and k_3 are arbitrary constants. Therefore adding k_1, k_2, and k_3 to regression coefficients results in arbitrary changes to those coefficients. Thus, standardized regression coefficients are essentially meaningless for this equation. (2) The values and significance levels of the unstandardized regression coefficients a_1, a_2, a_3, b_1, b_2, and b_3 will also change when the origin points of X_1, X_2, and X_3 are changed, but (3) a change in the origin points of X_1, X_2, and X_3 will have no impact on the value or the significance level of the unstandardized regression coefficient of the three-way interaction term (c_1), the value of the change in R^2 caused by introducing the three-way interaction term into the regression and its associated F, and the values for R^2 and F for the whole equation. In fact, with a suitable choice of origin points for X_1, X_2, and X_3, the coefficients a_1, a_2, a_3, b_1, b_2, and b_3 can be reduced to zero, leaving only the three-way interaction term with its unchanged coefficient c_1 in the equation. The net conclusion is that, except for the term c_1, the beta coefficients in Equation 1 are not interpretable since they can be altered by shifting the origin points of X_1, X_2, and X_3.

Dewar and Werbel (1979) argued that multiplicative interaction models like Equation 1 suffer from multicollinearity since the cross-product term is likely to be strongly correlated with the terms that compose it. However, several researchers (Gupta & Govindarajan, 1990; Smith & Sasaki, 1979; Southwood, 1978) have demonstrated that such multicollinearity can be completely eliminated by manipulating the origin points for X_1, X_2, and X_3 and reducing the R^2 for the regression equation between $X_1X_2X_3$ (the dependent variable) and X_1, X_2, X_3, X_1X_2, X_1X_3, and X_2X_3 (the independent variables) to zero. Such a transformation in the origin points for X_1, X_2, and X_3 does not in any way affect the value or the significance of c_1 in Equation 1. Thus, despite Dewar and Werbel's (1979) rejection of moderated regression analysis on the basis of multicollinearity problems, it can serve as a valid method for testing interaction effects.

If c_1 is significant, the corresponding incremental R^2 will also be statistically significant at the same probability level (Southwood, 1978), implying that the introduction of the term $X_1X_2X_3$ in Equation 1 adds significantly to the variance explained.

Finally, the control system variable (X_1) in Equation 1 is nominal, coded 1 for output control and 2 for behavior control. As Allison (1977: 151–152) mathematically demonstrated, recoding X_1 does not alter the R^2 of the equation or the value of t for the hypothesis that c_1 equals zero. Thus, the test for the presence of the three-way interaction does not depend on the coding of X_1.

A test for monotonicity. Although Equation 1 is a sufficient test of Hypothesis 1, it provides no information on whether the posited relationship is monotonic or not, information that is needed to test Hypotheses 2 and 3. Schoonhoven (1981) and Southwood (1978) suggested that such information can be obtained by examining the partial derivative of an equation of the

form of Equation 1 over one of the variables. We argued earlier that the selection of strategy affects the selection of control systems and resource sharing. Given this perspective, we fixed X_2 (strategy) and then examined the interaction between X_1 and X_3. For a fixed X_2, the interaction term, if significant, can be interpreted as changing the coefficient of X_1 or X_3. The assumptions about causality that are made determine the choice between these two variables. Mathematically, both approaches are equally valid. We chose to study the partial derivative of X_1, but results are the same if X_3 is selected. Therefore, taking the partial derivative of Equation 1 with respect to X_1 leads to

$$\frac{\partial Y}{\partial X_1} = a_1 + b_1 X_2 + b_2 X_3 + c_1 X_2 X_3. \tag{2}$$

The partial derivative of control system's impact on effectiveness in Equation 2 depends on two variables, the strategy employed and the level of resource sharing. If X_2, strategy, is a constant, Equation 2 can be rewritten as

$$\frac{\partial Y}{\partial X_1} = (a_1 + b_1 X_2) + (b_2 + c_1 X_2)\,X_3. \tag{3}$$

If the value of $\partial Y/\partial X_1$ in Equation 3 is always positive or always negative over the entire observed range of X_3, the relationship between Y and X_1, given a fixed value for X_2, would be regarded as monotonic; otherwise, it would be regarded as nonmonotonic.

In addition to fixing strategy and then analyzing the relationship between resource sharing and controls, we also considered the effects of analytically varying strategy. As will be seen under "Results," both ways of analyzing the data provide support for the hypotheses.

RESULTS

Table 3 contains the results of the multiple regression analyses undertaken to test the hypotheses. We used one regression equation with control mechanism, strategy, resource sharing, and the interactions of control with strategy, control with resource sharing, and strategy with resource sharing as the independent variables and a second with the three-way interaction term included.[8]

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[8] The relatively low values of R^2 reported in Table 2 need not be seen as detracting from our findings. The objective of this study was not to develop a strong model for predicting performance but to use regression as a data analytic technique for testing selected relationships (Cohen, 1968; Keppel, 1973: 555). Allison (1971) and Southwood (1978) argued that the appropriate test of a hypothesis is whether the introduction of the interaction term $X_1 X_2 X_3$ adds significantly to the variance explained. If the F associated with the change in R^2 caused by the introduction of the three-way interaction term into the regression equation is significant, the hypothesis is supported.

TABLE 3
Results of Multiple Regression Analysis for SBU Effectiveness[a]

Variables	Equation A	Equation B
Type of control	−.926	−4.935*
	(.797)	(2.068)
Competitive strategy	.497	7.517
	(.888)	(3.924)
Resource sharing	.019	−.328*
	(.041)	(.153)
Control × strategy	.855	−7.148
	(.803)	(3.901)
Control × resource sharing	.023	.333*
	(.040)	(.153)
Strategy × resource sharing	−.011	−.561*
	(.009)	(.262)
Control × strategy × resource sharing		.549*
		(.262)
R^2	.07	.12
F	1.08	1.30
ΔR^2		.05
F for ΔR^2		4.38*

[a] $N = 116$. Standard errors are in parentheses.
* $p < .05$

Interaction of Strategy, Control, and Resource Sharing

As the results under Equation B in Table 3 indicate, the regression co-efficient of the interaction term is positive and significant ($c_1 = .549$, $p < .05$). Further, introduction of the interaction term brings about a significant increase (at $p < .05$) in R^2, or the variance in SBU performance explained. This evidence of an interaction between type of control, type of strategy, and level of resource sharing supports Hypothesis 1.

The partial derivative of the second regression over X_1 yields the following:

$$\frac{\partial Y}{\partial X_1} = -4.935 - 7.148X_2 + .333X_3 + .549X_2X_3. \tag{4}$$

The effect on effectiveness of changing the control mechanism is a function of the strategy and resource sharing used in an SBU. In order to analyze the relationship for a low-cost SBU, we selected the extreme value for a low-cost strategy, setting it equal to −1. Equation 4 can then be expressed as

$$\frac{\partial Y}{\partial X_1} = 2.213 - .216X_3. \tag{5}$$

Equation 5 will yield zero when X_3 has a value of 10.24, so when X_3 is above 10.24, the equation will be negative, and it will be positive when X_3 is below

10.24. Thus, the inflection point of the slope—the value of X_3 at which a change in the direction of the slope occurs—is 10.24. This inflection point is within the range of values we observed for resource-sharing, 0 to 100 percent (Table 2). Therefore, for low-cost SBUs with high levels of resource sharing, output control is associated with higher effectiveness.[9]

To gain additional insights on the presence of monotonicity, we divided the scores on the strategy variable into four quartiles. The lowest quartile, referring to SBUs relying on a low-cost strategy, had values for strategy ranging from -1.00 to $-.40$ and a mean score on resource sharing of 24.37. This value is significantly higher than both the overall mean of 16.81 and the means for any of the other three quartiles, leading to two observations: (1) the low-cost SBUs were more likely to employ a high level of resource sharing, and (2) the low-cost SBUs by and large had resource-sharing values greater than the inflection point (10.24) for Equation 5. Thus, there is a relevant range problem in extending regression predictions to extremely low values of resource sharing in conjunction with the low-cost strategy.

In summary, for high values of resource sharing, greater emphasis on output control is associated with higher predicted effectiveness for low-cost SBUs. The inflection point of 10.24 is low enough relative to the mean of 24.37 that we can draw no conclusion on the optimality of behavior control. Thus, the data are consistent with Hypothesis 2.

To calculate the interaction of type of control and level of resource sharing on effectiveness for the differentiation strategy, we modified Equation 4, inserting 1 as the value of X_2. With this substitution, the equation is

$$\frac{\partial Y}{\partial X_1} = -12.083 + .882X_3. \tag{6}$$

The inflection point for Equation 6 is 13.70, which is within the range of values for resource sharing in the data. Therefore, in differentiation SBUs with high levels of resource sharing, behavior control is associated with higher effectiveness.

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[9] Although type of control is a nominal variable, the partial derivative of Equation 4 does assume a small change in this variable, which is methodologically impossible. However, these changes are monotonic. Therefore, the change is relevant up to the whole-integer change in value. For example, the full regression equation is $-4.935X_1 + 7.517X_2 - .328X_3 - 7.148X_1X_2 + .333X_1X_3 - .561X_2X_3 + .549X_1X_2X_3$. As we assume that X_2 equals -1 for a low-cost strategy, the equation becomes $-7.517 - 4.935X_1 - .328X_3 + 7.148X_1 + .561X_3 + .333X_1X_3 - .549X_1X_3$, or $-7.517 + 2.213X_1 + .233X_3 - .216X_1X_3$. As can easily be verified, output control is optimal for resource-sharing values below 10.24 and behavior control is optimal for values above 10.24, findings completely consistent with the partial derivative analysis we conducted.

The partial derivative over resource sharing could instead be taken. However, in this case the concept of an observed range is rather limited as only two values are possible. In summary, the choice of derivative does not change the results, and taking the partial derivative on control appeared to be a better way of presenting the data.

We would like to thank an anonymous reviewer for bringing these subtle points to our attention.

As in the analysis for the low-cost strategy, we divided the strategy scores into four quartiles. The highest quartile—SBUs relying on the differentiation strategy, with strategy scores ranging from .70 to 1.00—had a mean value on resource sharing of 12.32. This value is close to the inflection point for Equation 6. Thus, type of control has a nonmonotonic, or symmetrical, effect on effectiveness over the range of values for resource sharing for the differentiation strategy. For low values of resource sharing, output control is more effective, but for values above 13.70, behavior control is more effective. In addition, over the range of values found in this study, the highest predicted effectiveness scores for differentiation SBUs occurred with behavior control combined with high resource sharing. These results are consistent with Hypothesis 3.

Additional Analysis

The analysis discussed up to this point examined the relationship between control and resource sharing, given a fixed strategy. The two strategies examined were extreme low-cost and extreme differentiation. Relaxing the assumption of a fixed strategy, we analyzed the impact of type of control and level of resource sharing on effectiveness for changes in strategy. We first differentiated the regression equation with respect to the strategy variable:

$$\frac{\partial Y}{\partial X_2} = 7.517 - 7.148X_1 - .561X_3 + .549X_1X_3. \tag{7}$$

In this analysis, type of control system was fixed. If a value of 1 for output control is inserted into Equation 7, the following results:

$$\frac{\partial Y}{\partial X_2} = .369 - .012X_3. \tag{8}$$

This equation has an inflection point of 30.79. For resource-sharing values above 30.79, Equation 8 is negative, implying that output control and high resource sharing are associated with higher effectiveness for the low-cost strategy. This result is consistent with Hypothesis 2.

Likewise, if a value of 2 for behavior control is inserted, the following arises:

$$\frac{\partial Y}{\partial X_2} = -6.779 + .537X_3. \tag{9}$$

The inflection point for Equation 9 is 12.62; for resource-sharing values above 12.62, the equation is positive, implying that behavior control and high resource sharing coupled with a differentiation strategy are associated with increased effectiveness. This result is consistent with Hypothesis 3. The low inflection point means that for behavior control, a differentiation strategy is almost always associated with higher effectiveness.

DISCUSSION, CONCLUSIONS, AND FURTHER DIRECTION

Research Findings

This study attempted to integrate three major research streams. The first type of research we drew on has focused on the design of optimal control systems. In both organization theory (Ouchi, 1979) and agency theory (Baiman, 1982), output and behavior control are seen as alternative control strategies. Proponents of these theories have identified the conditions under which one or the other control alternative is appropriate.

The second type of research has centered on perhaps the most critical aspect of strategy implementation in large, multibusiness organizations: recognizing that different business units within the same corporation often pursue different strategies (Govindarajan & Shank, 1986; Porter, 1985; Shank & Govindarajan, 1988) and that the administrative mechanisms, including control systems, that corporate headquarters use to manage those businesses should differ (Govindarajan, 1988).

The third type of research has focused on the concept of synergy, whereby firms identify and exploit relationships among distinct SBUs (Andrews, 1971; Porter, 1985). This research has addressed two central issues, both important for this study: (1) the potential to receive synergistic benefits from resource sharing varies across strategic contexts (Porter, 1985) and (2) realizing synergistic benefits depends on how firms design control systems to manage linkages between SBUs effectively (Pitts, 1980, Vancil, 1980).

Integrating these research streams, we suggested that strategy, resource sharing, and controls interactively affect SBU effectiveness. Such an interaction implies that the strategy of an SBU (cost leadership or value leadership) and the degree of resource sharing it employs affect the antecedent conditions that in turn affect the parent firm's choice of output or behavior controls. Equivalently, the strategy of an SBU and its control system influence the effectiveness of resource sharing.

The results of the study lend support to the hypothesis that strategy, resource sharing, and control systems have an interactive impact on SBU effectiveness. The specific findings can be summarized as follows: (1) SBUs practicing a low-cost strategy tend to have a high level of resource sharing. (2) Output control combined with high resource sharing is associated with increased effectiveness for low-cost SBUs. (3) No conclusions can be drawn about the optimal control system for low-cost SBUs with low levels of resource sharing, since very few SBUs studied here had that combination. (4) SBUs practicing a differentiation strategy in general have lower levels of resource sharing than low-cost SBUs. (5) Differentiation SBUs have a wider range of levels of resource sharing than low-cost SBUs. (6) For differentiation SBUs with high resource sharing, behavior control is associated with increased effectiveness. (7) For differentiation SBUs with low resource sharing, output control is associated with increased effectiveness. (8) However, the highest effectiveness for differentiation SBUs occurs when behavior control is used in combination with high resource sharing.

Practical Implications

These findings have both practical and theoretical relevance. At the level of practice, this study's findings recommend that firms should not use a standard control system to manage all their SBUs. Control systems are an important ingredient in implementing strategy and should be tailored to the strategy of individual SBUs. For increased effectiveness, cost leadership and differentiation strategies need to be matched with output and behavior controls, respectively. Further, for increased effectiveness, the strategy of an SBU should be considered in determining the level of resource sharing to use. As the significant three-way interaction points out, decision makers should choose neither a control system nor a resource-sharing level in isolation.

Theoretical Implications

This study makes theoretical contributions to the literatures on both control-systems design and SBU-level strategy implementation.

Organization and agency theories have both commonalities and differences in terms of the conditions they identify as determining the choice between output and behavior control. Developing a comprehensive model of control, we argued that behavior observability, a key construct from agency theory; outcome observability, a key construct from organization theory; and task programmability, a key construct in both theories, have important impacts on the design of control systems.

An integrated organizational and agency perspective gives a more complete view of control than previous work has offered. For instance, a sole reliance on organization theory would have led us to predict output control for differentiation SBUs, since they have low task programmability. However, incorporating agency theory enabled us to argue for behavior control for differentiation SBUs since behaviors can be made observable through information systems even when task programmability is low. Similarly, a sole reliance on agency theory, which assumes outcomes are always observable, would have led us to predict outcome control for SBUs with high levels of resource sharing. Incorporating organization theory, which argues that outcomes are unobservable under certain conditions, enabled us to argue for behavior control in contexts with high resource sharing. Scholars studying strategy may benefit by taking an integrated perspective on control and building on the concepts illustrated in Figure 2.

This study is part of a program of research on strategy implementation at the SBU level (Govindarajan & Gupta, 1985; Gupta & Govindarajan, 1984; Govindarajan, 1988, 1989). The core premise of this research is that for superior performance, different SBU strategies call for systematically different types of executive leadership, structures, and planning and control systems. Some of the key empirical findings within this research can be summarized as follows. Executive leadership characteristics, structural variables, and control systems contribute differentially to the effectiveness of

SBUs practicing differentiation and low-cost strategies. In particular, in a differentiation SBU, the greater the R&D experience, the internality of the general manager's locus of control, and decentralization, and the lower the emphasis on meeting a budget, the greater the effectiveness. But for low-cost SBUs, the greater the manufacturing experience, degree of centralization, and emphasis on meeting a budget, the greater the effectiveness.

The present study extended this research along two dimensions, demonstrating the differential application of output and behavior control across SBUs with different strategic contexts and using a three-way interaction model instead of the bivariate analysis of previous studies.

Previous research has typically examined each implementation variable separately, on the basis of two rationales: (1) bivariate relationships, if significant, do contain information useful for action, and (2) bivariate relationships need to be tested before a researcher can decide what variables should be included in multivariate models.

Although bivariate analysis is an essential starting point, there is definite conceptual and practical merit in moving toward testing complex theories. Several variables might show significant effects in bivariate analyses, but if all these variables are simultaneously entered in a regression equation, one or more may be so salient as to dominate the others. Also, because "equifinality"[10] can arise, the effects of some variables that are significant in bivariate analyses might fail to show significance in a multivariate test. For instance, two implementation mechanisms could be substitutes for each other so that, once an optimal value on one mechanism is achieved, the value of the other mechanism becomes irrelevant.

This study has taken a small step toward building a more comprehensive theory of SBU-level strategy implementation by testing a trivariate model. Clearly, including all the implementation variables together in a complex, integrative model will lead to a better understanding of SBU effectiveness. From the standpoint of theory development, we therefore suggest that research developing and testing multivariate models is likely to yield greater payoffs. Two further implications follow: Considerable work is needed to develop complex theories arguing that, for superior performance, several implementation variables should be internally consistent and consistent with an SBU's strategic context. Further, researchers need to identify methods that can be used to test for dominance and equifinality.

Limitations and Avenues for Future Research

Future research could extend or modify this study along several dimensions. One area that needs a better theoretical basis and operational definition is socialization control. Despite the arguments of several scholars that

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[10] Instead of assuming a strategy-structure deterministic relationship ("one best way" to structure the organization to implement a given strategy), the equifinality approach argues that multiple design alternatives may exist to implement effectively a given strategy.

socialization is a key form of organizational control (Edstrom & Galbraith, 1977; Ouchi, 1979; Van Maanen & Schein, 1979), this study reported a low incidence of socialization control. Two possible explanations are that the measurement we used was not specific enough to detect socialization control and that very few U.S. organizations rely exclusively on such control. We assumed socialization control to be a form of behavior control. Disentangling behavior and socialization controls would be a useful analytic and empirical refinement of the present study, especially if it were extended to a multinational context, since firms in many other countries (e.g., Japan) rely more heavily on socialization than do U.S. firms.

Second, in addition to focusing on SBU performance as the dependent variable, future researchers could incorporate managerial outcome variables like job satisfaction. Since job performance and job satisfaction have not been consistently correlated (Petty, McGee, & Cavender, 1984), control systems could have differential effects on these two outcome variables. As a subjective process, behavior control necessarily implies ambiguity for subordinates since they cannot be completely certain about the performance criteria superiors are using or how the latter will interpret performance on any given criterion. This ambiguity is particularly strong when behavior controls are used to monitor and evaluate operational rather than strategic decisions. Since role ambiguity has been shown to decrease job satisfaction (Fisher & Gitelson, 1983), behavior control should decrease job satisfaction. Thus, behavior control associated with high effectiveness for a differentiation SBU might depress job satisfaction for its general manager. There is both theoretical and practical merit in exploring whether job satisfaction and performance are necessarily trade-offs in the context of designing controls over general managers.

Third, over time, an SBU's strategy or its levels of resource sharing may change, resulting in a mismatch between the controls in use and the new strategy. This mismatch may prevent or dramatically hinder the manager's implementation of the new strategy. How do firms develop an optimum control system that minimizes the transitional trauma an SBU must undergo when changing strategies?

Fourth, future research could incorporate other organizational variables that are relevant in implementing differentiated strategies and relationships. These variables include human resource policies such as cross–business-unit job rotation and general managers' functional and industry backgrounds; conflict resolution practices; structural features like centralization and liaison devices; and control system features like degree of budget participation and the mix of salary and bonus used.

Fifth, this paper can be related to work on multidivisional firms (Hill & Hoskisson, 1987; Hoskisson & Hitt, 1988; Vancil, 1980). Specifically, Hoskisson and Hitt found that a multidivisional structure leads to tight financial controls with a resulting focus on the short term and low risk. The researchers cited have hypothesized that as the number of divisions increases, the use of simple financial control will increase. Since simple financial control

is correlated with output control, a conglomerate with a collection of low-cost SBUs may be more successful than a conglomerate with differentiation SBUs. Interaction between and synthesis of these research streams could lead to new insights.

Sixth, though current basic theoretical notions regarding low-cost strategy and resource sharing are valid, resource sharing grows difficult to implement under conditions of high corporate diversification (Porter, 1985). Thus, future research could include corporate strategy as a moderator of the relationship between SBU strategy and resource sharing.

Finally, several methodological improvements to the present work are possible and needed. Objective measurements of strategy, controls, and resource sharing would be a useful extension. A longitudinal analysis would be one way of capturing causality and the possible lagged effects of the three-way interaction's fit on SBU performance. Finally, examining SBU-level strategy implementation issues in various generic industry environments would provide insights as to whether the present findings depend on industry characteristics.

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INTERPRETING STRATEGIC ISSUES: EFFECTS OF STRATEGY AND THE INFORMATION-PROCESSING STRUCTURE OF TOP MANAGEMENT TEAMS

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Understanding how managers interpret strategic issues is important to understanding strategic action, organizational change, and learning. However, little is known about how the context in which strategic issues are interpreted relates to the nature of interpretation. This study of 151 chief executive officers employed a cross-level analysis to investigate how two organization-level factors—strategy and the information-processing structure of the top management team—related to how chief executives in different organizations interpreted the same situation. Findings indicated that both strategy and information-processing structure are related to how chief executives label strategic situations and the range of variables they use during interpretation.

Understanding the factors that shape how top managers interpret their strategic environment is critically important since such interpretations ultimately affect organizational actions (Dutton, Fahey, & Narayanan, 1983). Understanding interpretation—the process of translating data into knowledge and understanding—should also hold a prominent place in any attempt to understand organizational change or learning (Daft & Weick, 1984).

Most existing studies of issue interpretation have focused on how top managers in different organizations have interpreted various strategic issues (e.g., Lyles, 1981; Mintzberg, Raisinghani, & Theoret, 1976). However, do differences in the content of the strategic issues under investigation or differences in the characteristics of the organizations in which the issues were interpreted explain variance in the findings within and across previous studies? Research that goes beyond differences in issue content to examine the effect of organizational context on interpretation is now needed (Daft &

Weick, 1984; Dutton et al., 1983). As Fredrickson (1983) pointed out, if researchers hope to understand and improve strategic decision processes, our understanding of what causes the same stimuli to be interpreted differently in different organizations should be a high-priority research question. To that end, the purpose of this research was to better explain the relationship between organizational context and the interpretation of strategic issues by chief executive officers (CEOs).

Previous work has offered several different descriptions of interpretation. For example, concepts such as sense making (Weick, 1979), formulation (Lyles & Mitroff, 1980), diagnosis (Dutton et al., 1983), and structuring (Abulsamh, Carlin, & McDaniel, 1990) have all described the process by which decision makers interpret strategic events. Mintzberg and his colleagues (1976), Lyles (1981), Dutton and coauthors (1983), and Cowan (1986) presented specific models of the interpretation process. Although these models differ in their breadth, each attempts to represent the process by which top managers in organizations translate events and develop an understanding of their environment.

Interpretation has been studied at the individual, group, and organizational levels. At the individual level, research has concerned the way individual knowledge structures, or schemata, affect interpretation (cf. Sims & Gioia, 1986). The emphasis has been on the notion that what people know influences what they can know. Past experience, prior knowledge, and existing schemata create frameworks that are used to reduce ambiguity and create meaning (Lyles, 1976; Ramaprasad & Mitroff, 1984). At the group level, the emphasis has been on how what people know influences what others know (and vice versa). This work has focused on the construction of shared meaning (Smircich, 1983), negotiated belief structures (Walsh & Fahey, 1986), and the consensual validation of reality (Weick, 1979).

The work of Daft and Weick (1984) and of Hall (1984), who attempted to establish a theoretical link between organizational context and interpretation, best represents research on interpretation at the organizational level of analysis. This research has suggested that the information from an environment that top managers attend to and the meaning they attach to that information are, in part, functions of frameworks embodied in organization-level contextual factors. These frameworks, or "modes of interpretation" (Daft & Weick, 1984: 289), affect which situations and events managers will attend to, which they will ignore, and which they will see as having a strategic impact on their organization. The research on this link between context and strategic-issue interpretation has been predominantly theoretical. Overall, work on strategic decision making has either only provided conceptualizations of the nature of the relationship or accorded the relationship face validity, accepting it as given.

The purpose of the current research was to test the relationship between organizational context and the interpretation of strategic issues empirically. Specifically, we explored how an organization's strategy and the information-processing structure of the top management team are related to the

labels the organization's chief executive officer applies to strategic issues and the range of variables the CEO uses in the interpretation process.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

Strategic issues are trends, developments, and dilemmas that affect an organization as a whole and its position in its environment (Egelhoff, 1982). "Issues" include opportunities, threats, and problems (Dutton & Ottensmeyer, 1987). Strategic issues are often ill-structured and ambiguous (Lyles, 1981) and require an interpretation effort (Daft & Weick, 1984; Mintzberg et al., 1976).
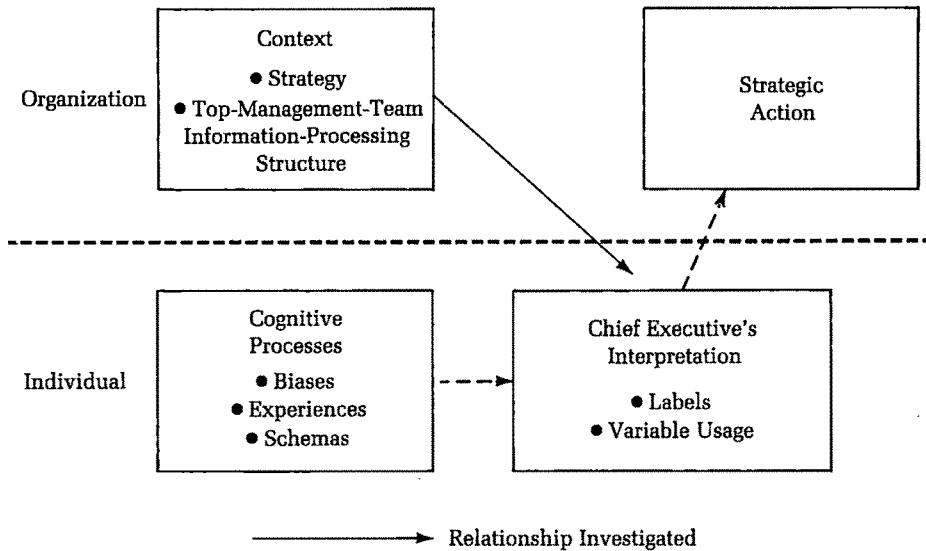
Even when exposed to identical stimuli, top managers in different organizations often construct different interpretations of the same strategic issue (Lawrence & Dyer, 1983; Meyer, 1982). The interpretations differ because they are subjective constructs (Wildavsky, 1979): a priori theories, beliefs, structures, and procedures influence perceptions about the issues (Hall, 1984). Past actions are stored in a "retained set" (Hall, 1984: 907) of organizational knowledge consisting of the memories of organization members, archival records, and organizational structures. This retained set provides frameworks for deciding what data to attend to and how to interpret those data. Both the cognitive processes of an organization's members and the contextual features of the organization embody these frameworks. Both elements frame the chief executive's interpretation of the environment, as shown in Figure 1. The present research focused only on the relationship between organization-level context and the interpretation of strategic issues by CEOs. This emphasis is consistent with findings of Ritvo, Salipante, and Notz (1979) showing that a CEO primarily interprets strategic issues and acts to coalign the strategy, structure, and environment of the organization to address those interpretations.

We assumed that a CEO's interpretation of a strategic issue would systematically influence strategic action at the organizational level. Past work has shown that how the top manager perceives a strategic issue affects the range of solutions considered in an organization (Billings, Milburn, & Schaalman, 1980), influences the amount of resources committed to a particular project (Staw & Ross, 1978), and affects the steps made toward organizational change (Dutton & Duncan, 1987).

Strategic Issue Interpretation

Strategic issue labels. The interpretation of a strategic issue is often represented by general labels such as "opportunity" or "threat." These labels capture top managers' beliefs about the potential effects of environmental events and trends (Edelman, 1977) and set in motion processes that move an organization in a particular direction (Dutton et al., 1983). Using the research literatures on managerial decision making, organizational crises, and individual stress, Dutton and Jackson (1987) identified three labels that can be used to differentiate the interpretation of a strategic issue (cf. Jackson

FIGURE 1
A Cross-Level Model of Strategic Issue Interpretation

Organization

| Context

● Strategy
● Top-Management-Team
Information-Processing
Structure | Strategic
Action |

Individual

| Cognitive
Processes

● Biases
● Experiences
● Schemas | Chief Executive's
Interpretation

● Labels
● Variable Usage |

⟶ Relationship Investigated

& Dutton, 1988). Three continua represent these labels: positive-negative, gain-loss, and controllable-uncontrollable.

The positive label for opportunities was derived from work by Mintzberg and colleagues (1976) and Nutt (1984). Frederickson (1985) further argued that opportunities represent situations in which gains are possible. Staw, Sandelands, and Dutton (1981) defined a threat as a negative situation, and Milburn, Schuler, and Watman (1983) equated threats with potential loss. A situation may be described as positive or negative for reasons that are not connected to the likelihood that it will lead to a gain or loss; the level of urgency, amount of difficulty, or stakes involved might also warrant a positive or negative label (cf. Jackson & Dutton, 1988). Thus, we used both the positive-negative and the gain-loss continua in our analyses.

Several researchers investigating stress (e.g., Averill, 1973) have argued that people also see threats as uncontrollable. Likewise, opportunities are seen as distinguished by a high degree of controllability (McCrae, 1984). Thus, we also used the controllable-uncontrollable continuum as a dimension differentiating interpretations of strategic issues.

Variable usage. Variable usage is the quantity of data about a situation that an organization's participants gather and use for interpretation (Daft & Macintosh, 1981). The amount of data gathered reflects the perceived level of understanding of a situation (MacKay, 1969): it will tend to be less when people believe they adequately understand a situation than it will be when they perceive the situation as poorly understood (Tushman & Nadler, 1978). Accordingly, top managers faced with ill-structured strategic issues will need

a large amount of data to arrive at an interpretation upon which they are willing to act (Huber, O'Connell, & Cummings, 1975).

Organizational Context

The present study is based on a cross-level analysis (Rousseau, 1985) of strategic issue interpretation. We investigated how organizational context, consisting of an organization's strategy and the information-processing structure used by its top management team, related to the interpretation of certain strategic issues by CEOs in different organizations (see Figure 1).

Previous work by Burgelman (1983) and Bower (1970) has emphasized the importance of the strategic and structural aspect of context in affecting decision behavior. Although their work did not specifically tie context to interpretation, other work has provided strong theoretical linkages. For example, Knight and McDaniel (1979) suggested that information-processing structures influence top managers' interpretations. The way a top management team is structured to process information about strategic issues limits or enhances recognition of issue stimuli, impedes the search for data, and mutes causal relationships associated with an issue (cf. Duncan, 1974; Staw et al., 1981). The strategy an organization pursues also affects interpretations (Daft & Weick, 1984). The prevailing strategy of an organization will cause certain variables or their relationships to go unnoticed, to be ignored, or to be emphasized by top management (Hambrick, 1981; Miles & Snow, 1978).

The information-processing structure of top management teams. We operationally defined the information-processing structure of top management teams during strategic issue interpretation using the dimensions of participation, interaction, and formalization (Duncan, 1974). We focused on top management teams because these relatively small groups at the tops of organizations provide the structural context for CEO's interpretations of strategic issues. Our focus is consistent with Aguilar's (1967) observation that below the level of vice president, participants in interpretation and other phases of strategic decision making are neither informed of issues pertaining to a whole organization nor involved in their resolution.

Structural characteristics such as high levels of participation and interaction and a low level of formalization facilitate a high level of information processing (Galbraith, 1973) and foster extensive use of information (Daft & Lengel, 1986). When top management teams can process a great deal of information, CEOs can attend to more variables and consider each variable more fully during interpretation efforts than they can when teams process less information. We expected, therefore, that a high level of participation, low use of standard procedures, and high level of interaction—characteristics of structures with a high capacity for information processing—would lead to interpretations characterized by high variable usage.

> *Hypothesis 1a: The capacity of an organization's top management team's information-processing structure will be*

> positively related to the extent to which the CEO uses
> variables for interpretation.

Information-processing structures characterized by narrow or restricted capacities—structures with high formalization and low interaction—will tend to lead CEOs to perceive low levels of positive stimuli (Fredrickson, 1986). These structures are designed to guard against threats, not to scan for opportunities (Bourgeois, McAllister, & Mitchell, 1978). However, even in times of crisis, top management teams characterized by high-capacity information-processing structures will continue to focus on and process information that they see as positive and as leading to potential gains (Smart & Vertinsky, 1984). This search process occurs because such structures facilitate coping with environmental uncertainty and using stress productively. Similarly, Lenz and Lyles (1983) suggested that strategic planning systems characterized by low information-processing capacity decrease the likelihood of proactive behavior by a chief executive because the goal of such a system is to monitor possible losses. Such behavior will, in turn, discourage the recognition and pursuit of opportunities (White, Dittrich, & Lang, 1980).

If a top management team does not have an information-processing structure that enables it to process information about a strategic situation adequately, the team will experience information overload (Mintzberg, 1983), which will lead to high levels of nonproductive stress among team members (Bronner, 1982; Cangelosi & Dill, 1965; Taylor, 1975). Such conditions may result in a CEO's believing that the consequences of any course of action cannot be predicted (Holsti, 1971) or that long-range outcomes cannot be controlled (Paige, 1968).

As Eisenhardt (1989) found, top management teams with the capacity to access and process information about strategic issues can cope with stress and anxiety. These teams impart a sense of mastery and control to decision makers since the executives feel they have surveyed and processed the needed information, leaving "no stone unturned."

A link between interpretation and the information-processing structure of the top management team of an organization seemed likely. Thus,

> *Hypothesis 1b: The capacity of an organization's top*
> *management team's information-processing structure*
> *will be positively related to the extent to which the CEO*
> *labels a strategic issue as positive.*

> *Hypothesis 1c: The capacity of an organization's top*
> *management team's information-processing structure*
> *will be positively related to the extent to which the CEO*
> *labels a strategic issue as a potential gain.*

> *Hypothesis 1d: The capacity of an organization's top*
> *management team's information-processing structure*
> *will be positively related to the extent to which the CEO*
> *labels a strategic issue as controllable.*

Organizational strategy. We viewed organizational strategy in terms of

the strategic patterns Miles (1982) described: domain defense and domain offense. According to this conceptualization, the type and extent of service and product offerings, the population served, relations with others in a market, and the success criteria used reflect a firm's strategic pattern.

Meyer (1982), Hambrick (1981), and others have suggested that an organization's prevailing strategy provides a framework within which its managers comprehend their environment and interpret strategic issues. Strategy serves as an organizational filter that separates the critical from the inconsequential (Huff, 1982). Therefore, top managers in an organization tend to interpret a strategic event on the basis of past organizational experiences that have become embodied in its existing strategy (Daft & Weick, 1984; Miles & Snow, 1978). This "selective perception" (Dearborn & Simon, 1959) causes the chief executive's interpretation processes to focus on what is needed to execute the organization's strategy and to ignore information that seems irrelevant to that strategy (Hambrick, 1981).

An organizational strategy, such as a domain-offensive strategy involving high levels of service and product diversity and change, requires that a CEO attend to many variables because the organization faces increased administrative and technological complexity. Organizations with relatively narrow and stable service and product lines—like those with domain-defensive strategies—allow their CEOs to attend to fewer variables because administrative functions have become efficient and standardized. The need to use more or fewer variables in order to execute a given strategy leads to a CEO's identifying more or fewer variables during interpretation efforts. Therefore,

> Hypothesis 2a: CEOs in organizations oriented toward domain offense will exhibit higher levels of variable usage during interpretation than those in organizations oriented toward domain defense.

Members of domain-defensive organizations assume that their external environment is a threat they must defend themselves against. The primary goal of such an organization is to protect its market niche against environmental threat by attempting to preserve its traditional service and product line. Domain-offensive organizations assume that their external environment presents opportunities that can be acted upon and realized through service and product innovation and market segmentation (Miles, 1982).

Managers tend to pay attention to information that confirms prior beliefs about the world (Einhorn & Hogarth, 1978; Staw & Ross, 1978). We expected, therefore, that CEOs in domain-defensive organizations would concentrate their search and analysis on information that they perceived as leading to potential environmental threats. Jackson and Dutton (1988) found that top managers perceive threats as having a clear negative connotation, as likely to bring loss without gain, and as associated with feelings of low control.

Further, the arguments above suggest that CEOs in domain-offensive organizations will be more sensitive to information that they perceive as indicating possible opportunities. Jackson and Dutton's (1988) findings also

revealed that top managers perceived opportunities as positive, as having a high potential to bring gain, and as associated with feelings of control. Therefore,

> Hypothesis 2b: CEOs in organizations oriented toward domain offense will be more likely to interpret a strategic issue as positive than will CEOs in domain-defensive organizations.

> Hypothesis 2c: CEOs in organizations oriented toward domain offense will be more likely to interpret a strategic issue as a potential gain than will CEOs in domain-defensive organizations.

> Hypothesis 2d: CEOs in organizations oriented toward domain offense will be more likely to interpret a strategic issue as controllable than will CEOs in domain-defensive organizations.

RESEARCH METHODS

A single industry was chosen for this research to control cross-industry effects on interpretation. It was also necessary to select an industry in which we could determine a priori that there would be intraindustry variance in CEO interpretations for a given strategic situation. Past work by Ashmos (1988) and Meyer (1982) suggested that hospitals would be appropriate research sites since findings from their research indicated that identical stimuli will generate different interpretations across top managers in hospitals. Some of these differences can be attributed to the severe external pressures that have changed the hospital industry from a high-growth, noncompetitive industry to a low-growth, highly competitive one (Cisneros, 1986). Third-party payers, state governments, insurance companies, industrial corporations, and the federal government have all forced top managers in hospitals to recognize and resolve strategic issues, even though strategic thinking is a relatively new concept in the hospital industry (Blair & Whitehead, 1988; Hein & Glazer-Waldman, 1988). In this environment, how strategic issues are interpreted has become central to hospitals' survival (Shortell, Morrison, & Robbins, 1985).

Data Sources

The data for this study were collected from two sources. The first was a questionnaire distributed to hospital CEOs in a single state. All respondents used in the analysis indicated that they were the chief executives of their organizations. The second source was archival data obtained from annual trade publications.

A two-part questionnaire, consisting of 114 items, was mailed to the CEOs of all 545 hospitals in the state (excluding university health centers, prison hospitals, and hospitals located on military bases). We used the first

part of the questionnaire to gather information about the independent variables: the information-processing structure of top management teams and organizational strategy. The second part of the questionnaire focused on the dependent variables: the issue labels applied to strategic case scenarios and the case-specific variables used for interpretation. We pretested the questionnaire through structured interviews lasting from one to two hours with 11 hospital top executives.

To enhance generalizability, we gave respondents two sets of stimuli in the form of two case scenarios. The two cases differed in content but were identical in terms of the amount and type of information provided. Thus, we could test whether the hypothesized relationships remained constant across case content.

One case concerned hospital satellite centers and the other involved a health maintenance organization (HMO).[1] Appendix A contains the full texts of the scenarios. Each case provided 16 pieces of information balanced along three dimensions: (1) whether the information was generated inside or outside the hospital, (2) whether it was from a formal or informal source, and (3) whether it represented something that would add to or subtract from hospital operations. Two versions of the questionnaire were used, differing only in the order in which the cases appeared.

A total of 210 hospital chief executives returned the questionnaire, for a response rate of 38.5 percent. Of these responses, 59 were unusable either because respondents failed to complete parts of the questionnaire ($N = 17$) or saw the cases as not strategically relevant to their hospital ($N = 31$), or because we could not obtain archival data to assess a hospital's strategy ($N = 11$; see "Strategy"). The distribution of size, type, and ownership among the remaining 151 hospitals was not significantly different from distribution of those characteristics in the state's total hospital population; chi-square tests all showed probabilities greater than .25.

Variables

The questionnaire included multiitem scales with 7-point Likert response formats for all variables. We averaged the items in each scale to calculate a variable score.

Strategy. The seven items measuring organizational strategy were based on Miles's (1982) strategic dimensions but framed in language applicable to hospitals. Appendix B gives the complete scale. We coded the items so that high scores indicated domain-offensive behavior. The following is a sample item: "To what extent does your hospital try to offer innovative medical services in the area?"

In addition to the strategy scale in the questionnaire, archival data were

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[1] A health maintenance organization (HMO) is an alternative form of health insurance through which members are provided comprehensive health care for a set fee. Members can only use those hospitals and physicians approved by the HMO.

used to assess strategies. We examined the quantitative change that had occurred in each hospital's service and facility offerings over a five-year period (1983–87). Since an important dimension of Miles's offensive-defensive strategy classification is the extent to which organizations add innovative services and products or keep and improve existing ones, this measure of service change provided a valid measure of strategy.

The *Annual Guide Book* published by the American Hospital Association reports 54 service or facility categories for all U.S. hospitals. For each of the hospitals analyzed here, we constructed a profile of service offerings in 1983 and 1987, using a method based on Hambrick's (1979, 1981) work. We weighted service additions according to how innovative they were: a service a hospital had added by 1987 that 50 (one-third) or fewer of the hospitals offered in 1983 received a weight of three, a service added by 1987 that existed at 51 to 100 hospitals in 1983 received a weight of two, and a service added by 1987 that existed at 100 or more of the hospitals in 1983 received a weight of one. The difference between the number of services offered in 1983 and the summed weights of the services offered in 1987 was the measure of service and product innovativeness for each hospital over the five years. Hospitals with high scores on this measure were considered domain-offensive, and those with low scores, domain-defensive. Because services that were innovative in 1987 received a higher weight, hospitals that discontinued noninnovative services between 1983 and 1987 while adding innovative services were still considered domain-offensive.

Top-management-team information processing. The nine items in the scale assessing the information processing of top management teams were drawn from Duncan (1973, 1974) and coded so that high scores indicated a high capacity for information processing. Appendix B gives all items. An example from this scale is "To what extent is there a free and open exchange of ideas among team members about strategic issues?"

Strategic issue labels. Each of Dutton and Jackson's (1987) three strategic interpretation dimensions (positive-negative, gain-loss, and controllable-uncontrollable) was treated as a separate dependent variable. We posed five questions to identify the extent to which a CEO would use each label to describe the case scenarios. These items were based on the questionnaire used by Jackson and Dutton (1988). For example, after respondents had read a case scenario, they were asked: "To what extent would your hospital label the situation as something positive," ". . . feel that benefits will come from the situation," and ". . . feel it can manage the situation instead of the situation managing it?" The continua were scaled so that high ratings on these questions respectively indicated that respondents labeled the case situation as positive, as a gain, and as controllable. Appendix B gives the complete set of questions measuring the three dimensions.

Information usage. The 16 information items used to construct each of the case scenarios were presented to the respondents, who were asked to indicate the extent to which the hospital would use each to clarify and define the strategic situation presented. For example, in the HMO case,

respondents were asked "To what extent would you use the information that indicated that HMOs have penetrated 20 percent of the market in your area?"

Analysis

To test the hypothesized relationships between the independent variables—the information-processing structure of top management teams and organizational strategy—and the dependent variables (the labels applied to issues, and variable usage), we used a repeated-measures multivariate analysis of variance. We also tested the interaction term (strategy × top-management-team information processing) and the effect of the version of the questionnaire respondents received. The content of the two cases was used as a within-subjects factor.

RESULTS

Convergence of the Strategy Measures

The weighted scores for service additions ranged from − 2 to 39, with a mean of 11.16 ($N = 151$). Service addition scores were significantly correlated to the strategy score we calculated using the multiitem scale in the questionnaire ($r = .64, p < .001$). This convergence gave us confidence that both measures of strategy were valid indicators of how the hospitals interacted with their strategic domains. To avoid problems associated with common methods variance, we used the weighted service addition score as the measure of strategy in the calculations testing hypotheses.

Descriptive Statistics

Results from the MANOVA indicated no significant differences between responses to questionnaire items pertaining to the dependent variables across the two cases or to the two versions of the questionnaire. Because there were no significant differences in responses across the two cases for the dependent variables, we calculated Pearson correlation statistics using combined measures: within each hospital, we averaged responses for each dependent variable across the two cases. Table 1 gives means, standard deviations, and appropriate Cronbach alphas (α) by case, and Pearson zero-order correlations.

Multivariate Results

With the weighted service scores as the measure of strategy, multivariate analysis using Wilks's lambda (λ) indicated that the set of independent variables was significantly correlated to the set of dependent variables ($\lambda = .74$, $F_{12,381} = 3.80, p < .001$). Results also indicated that the characteristics of top management teams' information processing ($\lambda = .89, F_{4,144} = 2.61, p < .05$) and organizational strategy ($\lambda = .94, F_{4,144} = 2.09, p < .01$) were each significantly related to the set of dependent variables. The interaction of strategy and top-management-team information processing was not significantly related to the dependent variables.

TABLE 1
Means, Standard Deviations, Reliabilities, and Correlations[a]

Variables	Means		s.d.		α		1	2	3	4	5
	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2					
Independent											
1. Weighted service changes	11.16		8.51								
2. Top-management-team information processing	5.51		0.98		.83		.24*				
Dependent											
3. Variable usage	5.56	5.40	0.84	0.69	.87	.83	.19*	.35***			
4. Positive-negative	4.66	4.25	1.28	1.23	.86	.86	.04	.18*	.14		
5. Gain-loss	4.76	4.33	1.20	1.21	.87	.85	.07	.16*	.12	.90***	
6. Controllable-uncontrollable	5.12	4.98	0.95	0.99	.68	.64	.22*	.42***	.36***	.50***	.54***

[a] $N = 151$. We calculated Pearson correlations using average results from the two case conditions.

* $p < .05$
** $p < .01$
*** $p < .001$

Test of Hypotheses

The hypothesized relationships were tested with the univariate results from the MANOVA. Because we found the interaction term, case effect, and order effect to be nonsignificant, we dropped them from the model for this analysis. The results are presented for each of the independent variables.

Top-management-team information processing. The information-processing structure of a top management team was significantly related to variable usage ($F_{2,148} = 20.85$, $p < .001$). Beta coefficients indicate that the direction of the relationship is positive, providing support for Hypothesis 1a.

The information-processing structure of a top management team was also significantly related to all three labels: for the positive-negative dimension, the value of F was 4.58 ($p < .05$); for gain-loss, F was 3.11 ($p < .05$); and for controllable-uncontrollable, F was 29.35 ($p < .001$); all $df = 2,148$. Table 2 gives these results. The positive direction of the relationships shows support for Hypotheses 1b, 1c, and 1d.

Organizational strategy. Univariate results from the MANOVA (Table 2) show that variable usage ($F_{2,148} = 4.21$, $p < .05$) is significantly related to strategy, with betas indicating that the relationship is in the direction hypothesized. Thus, Hypothesis 2a was supported.

When we examined the relationship between strategy and labels, only the controllable-uncontrollable continuum was found to be significantly related to strategy ($F_{2,148} = 5.13$, $p < .05$), supporting Hypothesis 2d. Since the positive-negative and gain-loss labels were not significantly related to strategy, Hypotheses 2b and 2c were not supported.

DISCUSSION

Bower (1970) and Burgelman (1983) cited the importance of the strategic and structural context of an organization in managing and implementing strategic decisions. However, knowledge of how these contextual features affect the interpretation aspect of strategic decision making has been lacking.

TABLE 2
Summary of ANOVA Results[a]

Variables	Organizational Strategy	Top-Management-Team Information Processing
Variable usage	4.21*	20.85***
Positive-negative	0.27	4.58*
Gain-loss	0.69	3.11*
Controllable-uncontrollable	5.13*	29.35***

[c] F-statistics with $df = 2, 148$ are reported in table.
  * $p < .05$
  ** $p < .01$
  *** $p < .001$

The findings of the present study lead to new insights into how context affects the meaning that top managers attach to strategic situations. The research shows that two organization-level characteristics—strategy and the information-processing structure of the top management team—account for some of the variance in interpretation across CEOs in different organizations. These findings suggest that any attempt to explain, predict, or control an interpretation of a strategic issue is incomplete unless it addresses the strategic and structural context in which interpretation takes place.

How a strategic situation is interpreted will affect what actions an organization will take (Meyer, 1982). A situation labeled as positive will be acted upon much differently than a situation that is labeled as negative (Smircich & Stubbart, 1985). This study suggested that if CEOs want to alter their interpretation of their environment and the range of variables they consider in interpretation efforts, they may wish to manage their top management team's capacity to gather, process, and convey information. Change in information-processing capacity may alter CEO's conceptual lenses and subsequently, their range of possible actions.

The findings did not support the hypothesis that domain-offensive strategies will lead to a positive outlook and the perception that a strategic situation will bring gain. One possible explanation for the finding is that organizational strategy may not determine whether a strategic issue is labeled as positive or negative or as involving gain or loss. Rather, the impact of strategy on interpretation may be that strategy guides top managers as they attempt to determine whether an organization can control the factors surrounding a strategic issue. This determination of controllability, which occurs within what Burgelman (1983) called the strategic context, appears to be independent of whether outcomes are perceived as good or bad. The findings further suggest that it is the structural context (Bower, 1970) that facilitates information processing concerning possible outcomes like gains and losses associated with a given strategic issue. This idea extends the Jackson and Dutton (1988) findings by identifying the specific roles of context in top managers' interpretation of opportunities and threats. The findings also suggest that the positive-negative and gain-loss labels are so highly correlated that future studies may wish to employ only one or the other as an issue descriptor.

A complementary explanation for the nonsignificant results may be that the extent to which a situation is interpreted as positive or negative and as involving a gain or a loss may be a function of the issue itself or of the information processed about the issue, and not a function of an organization's strategy. For example, the CEO in a domain-offensive hospital may feel that the hospital would be able to control a contractual relationship with a local HMO. But whether entering that relationship will be perceived as a positive or potentially gainful strategic action is a function of the information processed about characteristics like the size, location, and financial strength of the target HMO.

The findings may also have implications for how strategy is formulated

over time. Top managers in organizations with limited information-processing capacity are likely to interpret strategic issues as threatening. The threat-rigidity hypothesis (Staw et al., 1981) suggests that in the presence of threat, organizations will constrict their information-processing capacities. This idea, coupled with the present findings, suggests a positive feedback "loop" that may over time cause domain-defensive organizations to become even more defensive or to limit information-processing capacity even more. As Starbuck stated, "People choose variations and interpret results within the frameworks of their current beliefs and vested interests, so misperceptions not only persist, they accumulate" (1983: 100). Altering the strategic or structural context in which interpretations persist and accumulate may be one way to interrupt a positive feedback loop and thereby facilitate strategic change.

This work also corroborates the findings of Eisenhardt (1989). Top management teams with a high level of participation in strategic decision making and a well-developed ability to access and analyze information do give top managers a sense of mastery and control over strategic decisions and increase the range of variables to be considered. The strategy of an organization also plays a critical role in influencing those perceptions and actions and may have important implications for the speed of decision making.

Certain limitations of this study should be noted. The hospital industry is a high-technology, semiregulated service industry characterized by a turbulent environment, high competition, and low growth. It remains to be seen whether findings will be similar in other kinds of organizational settings. Furthermore, single informants—the hospitals' chief executives—provided the data on characteristics of the top management teams' information-processing structures and the interpretation items. As Figure 1 shows, individual biases, experiences, and schemata also affect the meaning a CEO attaches to a strategic issue, and we do not know what role those elements may have played in these results. Finally, it should be noted that we tested the relationship between context and interpretation through the use of hypothetical, though quite realistic, cases, not through observations of how CEOs interpreted actual situations.

A number of research opportunities can be identified. The strength of the relationships between the information-processing structure of a top management team and all the dependent variables suggests that information-processing structure is a key to explaining how, and what, meaning is attached to strategic issues. Further clarification of that relationship would be an important contribution to understanding how top managers, in particular those outside the hospital industry, interpret their environments. Also, there is now a "critical mass" of interpretation research at the individual and group-organization levels of analysis. Research is now needed that examines the combined effects of intrapersonal, interpersonal, and contextual variables on strategic issue interpretation. Of critical importance is determining how contextual features of organizations and other antecedents to interpretation affect performance.

How this understanding of the link between context and interpretation can be used to assist managers in their interpretation efforts also warrants further research. For example, are domain-offensive firms with top management teams characterized by a high level of information-processing activity subject to costly decision errors if they systematically perceive strategic issues as controllable when in fact the situations are uncontrollable?

CONCLUSIONS

The interpretation processes associated with strategic issues have been viewed as a mechanism by which CEOs choose the labels and the information they use to understand strategic situations. Weick (1979) referred to the information that is chosen and processed in interpretation as a "workable version of reality." His statement does not imply that interpretation processes produce a perception of the world that is an act of invention. Rather, the CEOs' representations of their environments contain truths that have been elaborated on in some systematic way through certain contextual characteristics of their organizations.

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APPENDIX A

Case Scenarios[a]

Scenario One

The make-up of the area population, along certain dimensions, appears to be changing. For example, a recent study by the hospital reveals that nearly ⅓ of the area population has no regular physician and, considering that the number of medical indigents in the area is dramatically increasing, this proportion may continue to increase quite steeply.

At a recent executive committee meeting, a colleague remarked that nearly 10% of the local population is ineligible for health insurance coverage or government-funded health cost assistance. Additionally, the trend in the area towards more service-oriented jobs and self-employment may lead to more and more people being uninsured. The rumor of a new, and supposedly quite large, firm coming to the area is also discussed.

The hospital has been contemplating adding satellite centers to its operations. The mix of services offered by the hospital has seemed right, but the occupancy rate has continued downward. This has suggested to some that the hospital needs to reach out into the perimeters of the area to seek more patients. With the hospital's reputation for quality care and with its capacity to handle increased service provision, your colleagues feel this possible expansion is attractive. However, there is a general concern that there may be some difficulty in attracting needed physicians. Further, with the general shortage of nurses in the area there is concern that nursing support for the centers may be a problem.

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[a] Texts are verbatim.

A page in the recent hospital financial report shows that DRG[b] outliers are increasing. Given that nearly 40% of reimbursement for services to the hospital is from Medicare (with about 30% from commercial services) this information on outliers could have an effect on the financial performance of the hospital.

Scenario Two

The role of HMO's in serving the medical needs of the area is changing. Information to support this includes a survey performed by the hospital which shows that HMO's have penetrated nearly 20% of the market for those under 65 years old. It has been suggested that this percentage could easily grow to 30–35% in the next 15 years if the HMO option is made more available.

Additionally, a local marketing firm hired by your hospital to track consumer trends in the area reports that the population in the area will be increasing through the year 2000. Currently, 75% of the population is under 44 years old. It is expected that this percentage will remain constant during the period. Executive staff feels that the medical needs of this growing population will not only change, but show dramatic growth in certain areas.

However, a recent internal operations report circulated to staff indicates that ambulatory care utilization of the hospital has fallen off. Some feel this downward direction in ambulatory care utilization may continue in light of the increase in the number of physician group practices and the in-house services that many of these groups are providing (a trend that will probably continue).

An HMO has approached your hospital to negotiate a contractual agreement for the provision of certain services to its members. Your hospital was chosen, according to the HMO representatives, because of its good name recognition and location—two factors that scored very high in a recent survey of HMO members who were asked why they would choose a particular hospital. For some of the services requested by the HMO your hospital is presently unable to meet expected demand. However, top management has always maintained that it would be capable of bringing about needed expansion or change, though many feel a major reorganization of the hospital may be necessary. Attracting additional and/or specialty medical staff for any expansion program would not be difficult.

APPENDIX B

Questionnaire Items

Strategy

To what extent does your hospital:

    Continually search for new patient bases?
    Try to be the first to offer innovative medical services in the area?
    Offer a wide range of medical services?
    Strongly compete with other hospitals for new patients?
    Acquire new technology to attract patients?
    Enter into joint ventures with other hospitals in the area?
    Focus on a particular segment of the population to serve?

Information-Processing Structure

Before asking the following questions, we asked respondents to indicate how many people in the hospital were members of the top management team.

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[b] A DRG is a diagnostic related group. "DRG outliers" are third-party reimbursements that fall outside of a standard payment schedule for that group.

To what extent:

> Are written rules and procedures followed when this team addresses a strategic issue?
> Can decision making by this top management team be characterized as participative?
> Do the individuals on this team interact with each other on an informal basis?
> Can decision making by this top management team be characterized as rule-oriented?
> Are committees, such as ad hoc task groups, regularly formed to deal with strategic issues?
> Do all members of the team participate in strategic decision making on a regular basis?
> Can decision making by this top management team be characterized as interactive?
> Do one or two of the people on the team dominate the handling of strategic issues by the hospital?
> Is there a free and open exchange of ideas among group members about any strategic issues?

Positive-Negative, Gain-Loss, and Controllable-Uncontrollable Dimensions

There are 5 items for each dimension. All 15 items were repeated after each scenario was presented.

To what extent would your hospital:

> Perceive that benefits will come from the situation?
> Label the situation as something negative?
> Have a choice about whether or not to address the situation?
> Feel the future will be better because of the situation?
> Label the situation as a potential gain?
> Feel it has the capability to address the situation?
> See the situation as having positive implications for the future?
> Feel that there is a high probability of losing a great deal?
> Feel it can manage the situation instead of the situation managing it?
> Be constrained in how it could interpret the situation?
> Feel that how the situation is resolved will be a matter of chance?
> Feel that there is a high probability of gaining a great deal?
> Label the situation as a potential loss?
> Label the situation as something positive?
> See the situation as having negative implications for the future?

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SMALL FIRM ADAPTATION: RESPONSES OF PHYSICIANS' ORGANIZATIONS TO REGULATORY AND COMPETITIVE UNCERTAINTY

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This study addressed the pattern of small organizations' adaptation responses to uncertainty in the regulatory and competitive sectors of their environment using data from physicians in solo practice. An existing general model of adaptation was modified to reflect small-firm work processes. The result is a four-cell model that distinguishes adaptive strategies in terms of their functional orientations and how firms pursue them—whether alone or in collaboration with other firms. Data analyses supported the propositions that adaptation in small firms is a multicomponent construct and that regulatory and competitive uncertainty differentially influence the adaptation process. Although individual relationships found among the sets of adaptation activities supported the contention that adaptation choices follow a hierarchical cost pattern, the overall fit of the model suggests modification of the theory in subsequent research efforts.

An accepted tenet in organizational research is that environments are multidimensional and pose varying sources of ambiguity for organizations (Dess & Beard, 1984; Duncan, 1972; Hall, 1977; Ungson, James, & Spicer, 1985). Despite acceptance of this view, most previous research has emphasized organizational exchanges with the customer, competitor, or supplier sectors of environments. Responses to government are less well understood.

For many organizations today, the sociopolitical sector of the environment represents a major source of uncertainty. The costs associated with governmental regulation are substantial (Weidenbaum, 1981), and expectations of new regulatory legislation often induces severe anxiety among those affected. The turbulence in the competitive environment that frequently accompanies regulatory change further compounds the equivocality posed by the changes themselves. The introduction of legislative constraints often alters the barriers to entry or exit in market structures, hastening the demise of some organizational forms and enhancing the emergence of others.

Organizations whose success or survival is threatened by changes em-

anating from legislative actions can be expected to initiate adaptation responses intended to improve their fit with their environment. Coping actions designed to combat such dominant competitive issues for organizations may be compatible with the environmental niche a firm currently occupies or may prompt it to enter a new one. The choice of which action to pursue depends largely on the costs associated with a response.

An assumption here is that adaptation has costs and that where possible, organizations attempt to limit those costs. In other words, the alterations an organization makes to maintain environmental fit require shifting some established behavioral patterns (Miller & Friesen, 1984). Cook, Shortell, Conrad, and Morrisey (1983) contended that costs associated with implementation, loss of autonomy, increased dependency, and increased uncertainty may arise. A second assumption here is that the adaptation choices organizations make follow a hierarchical pattern based on the relative costliness of the resulting organizational changes.

The value of selecting adaptation responses that are no more costly than necessary is obvious for any organization For small firms, the appropriateness of a choice is especially critical. Such organizations are particularly vulnerable to environmental interruptions since they rarely have sufficient slack resources to buffer themselves from their environment. Judicious adjustments that minimize the costliness of realignment are imperative.

Although research has provided some evidence to support the contention that organizational adjustments to regulatory constraints are related to size (Birnbaum, 1984; Ungson et al., 1985), it has offered little information concerning the pattern of small firms' adaptation choices. Furthermore, whether regulatory uncertainty and the accompanying competitive uncertainty affect the adaptation process in different ways is unknown. The intent of the present study was to examine whether adaptation responses follow a hierarchical cost pattern by examining the relative importance various categories of adaptation responses have in small firms. I first propose an adaptation model suited for small organizations and then examine the relationships among regulatory uncertainty, competitive uncertainty, and the adaptation pattern.

A TYPOLOGY FOR SMALL-FIRM ADAPTATION

Two themes have dominated the development of the adaptation construct in previous research. Emphasis has been either on grouping, or categorizing, adaptation activities according to their orientation or on distinguishing organizational types according to the adaptation activities pursued. A major contribution of the efforts to distinguish sets of adaptive activities is their potential for linking specific sources of environmental variation to corresponding realignment actions (Hickson, Hinings, Lee, Schneck, & Pennings, 1971; Katz & Kahn 1978; Thompson, 1967). Models that focus on discriminating organizational types extend the adaptation construct by introducing a process orientation: not only what occurs, but how it transpires, is of interest (Lawrence & Dyer, 1983; Miller & Friesen, 1984).

A comparison of the adaptation models that group activities and those that group organizations reveals that both types are useful for predicting certain aspects of organizational adaptation. Insight specific to small organizations is, however, limited. For example, consider Lawrence and Dyer's (1983) predictions concerning organizational adaptation. Small organizations, they contended, are more likely to be found in environments with high information complexity. When resource scarcity is low, these organizations often exploit information complexity by adopting "prospector" strategies (Lawrence & Dyer, 1983: 315). Firms in young industries exemplify this situation. Conversely, when high information complexity is coupled with high resource scarcity, firms are more likely to choose "defender" strategies (Lawrence & Dyer, 1983: 315). Most organizations, Mintzberg (1984) contended, pass through such an environment in their formative years, when their simple structure limits the range of possible adaptation options. But what about organizations that intentionally remain small long after they pass the origination stage? The job specialization, extensive training and indoctrination, and complex tasks in organizations of professionals like physicians and lawyers would seem to align them closely with a configuration Mintzberg (1984: 79) termed professional bureaucracy. Do small organizations of such professionals initiate reactor strategies as do other professional bureaucracies, even though such small structures are best suited to environments with low levels of information complexity and resource scarcity (Lawrence & Dyer, 1983)?

Cook, Shortell, Conrad, and Morrisey (1983) offered a typology that embodies the theoretical advances of prior research yet can be modified to focus specifically on small firm adaptation. Presenting this framework as a general theory of organizational response to regulation, those authors distinguished sets of adaptation activities and proposed the hierarchical time orderings, or paths, of the adaptive responses included. Essentially, they posited that adaptation responses vary along two dimensions. The first dimension is the contrast between modifying internal structure and engaging in collaborative activities with other firms. The second dimension is a measure of where in an organization adaptation is likely to occur.

Underlying the first dimension, the distinction between intraorganizational and interorganizational adaptation, is the issue of decision control. Modifications firms make to their internal structure to protect or increase organizational autonomy reflect a desire to keep decision authority firmly within themselves. Conversely, cooperative arrangements with other firms necessarily require firms to share decision control. Bresser (1988) referred to this distinction in terms of competitive versus collective strategies.

Cook and colleagues further divided intraorganizational and interorganizational responses according to where in an organization a realignment occurs. They used Parson's (1956) distinction between institutional, managerial, and technical levels to differentiate the functional orientation of adaptation activities. They defined adjustments in initiating or maintaining activities connected with external entities as the prerogative of an organization's

institutional level. Alterations in the procurement and allocation of scarce resources occur at the managerial level, and changes in how inputs are transformed into services or products occur at the technical level. By aligning the three levels of functional orientation with the contrast between intraorganizational and interorganizational adjustments, they identified six distinct sets of adaptive responses.

Modifying the Model to Explain Adaptation in Small Firms

Conceptualizing adaptive responses as sets of activities diffused across an organization offers several advantages for explaining adaptation in small firms. Where early models tended to view environments as aggregates having a generalized influence on organizations, the six-cell model accommodates a multidimensional perspective on environment. The recognition that an environment has various sectors and categories, each which may differentially impact an organization, suggests that linkages between specific sources of environmental variation and particular realignment activities can be established. Although Cook and colleagues limited their hypotheses to tests of regulatory influence, their model can be extended to investigate exchanges with other environmental sectors.

Implicit in the proposition that specific linkages can be identified is the assumption that an organization is only loosely coupled to its environment. Decision makers, spared from responding to every event that occurs (Pfeffer & Salancik, 1978), can evaluate the cost of adaptive response relative to the threat its environmental source presents. As environmental conditions change, an organization can accommodate variation by altering its structural form, strategy, emphasis on efficiency, or innovation efforts in a piecemeal or incremental fashion. By adjusting incrementally, small firms may be able to delay or even avoid the more costly alternatives.

The incremental perspective is consistent with previous theories that emphasize a sequence of realignment responses (Aldrich, 1979; Weick, 1976). Previous theories have not clarified, however, whether firms initiate a sequence of adaptation activities ranging from the least to most costly in response to variation in certain environmental sectors but initiate a direct, more costly, response to accommodate variation in other sectors. Pinpointing differences between the influences of regulatory and competitive uncertainty on the hierarchical cost pattern in small firms requires further examination of sets of responses.

Cook and colleagues' use of hierarchical levels to discriminate adaptation responses is consistent with the division of labor, or structural differentiation, found in large organizations (Blau, 1972; Blau & Schoenherr, 1971; Meyer, 1972). For small organizations, however, the applicability of these three levels for describing work patterns is less certain. In particular, it is doubtful that a substantive distinction can be made between institutional and managerial activities. Instead, these two sets of activities, both of which involve administrative actions, are more likely to merge in a general managerial category. The relevant distinction for a small firm is between re-

sponses that involve managing it (the managerial level) and those that involve transforming inputs into outputs (the technical level). Examples of managerial responses initiated intraorganizationally are the installation of a management information system or other boundary-spanning mechanism. An interorganizational managerial response might be pooling resources to lobby federal agencies or gain consumer support across an industry. At the technical level, an intraorganizational adaptation might involve altering a product mix or increasing efficiencies in a production process. Interorganizational collaboration at the technical level might include sharing production facilities or channels of distribution. This functional perspective contrasting managerial and technical activities parallels Daft's (1982) proposal that organizations are composed of an administrative and a technical core, each with its own subenvironments. Table 1 displays the proposed four-cell model.

Collapsing the two administrative levels into one alters the time path among the sets of activities Cook and colleagues proposed. The following section develops proposals concerning resultant changes in the pattern of adaptations' degrees of costliness.

HYPOTHESES

An assumption in the argument that organizational adaptation occurs along a continuum of costliness is that decision makers are capable of interpreting their environment and making choices. McKelvey (1982) argued that environments do not cause variations among organizations—they only select the organizations that survive. It is up to the organizations' members to analyze the uncertainty posed by environmental volatility. Taking an information perspective on environments, Pfeffer and Salancik described uncertainty as "the degree to which future states of the world cannot be anticipated and accurately predicted" (1978: 67). The challenge for organizations is to interpret their environment and devise strategies that let them

TABLE 1
Examples of Adaptation Responses[a]

Level	Responses	
	Intraorganizational	Interorganizational
Managerial	Environmental monitoring	Joint ventures
	Greater use of consultant's advice	Joint planning
	Managerial education programs (to understand changing environment)	
Technical	Change in product mix	Sharing production facilities
	Change in production schedule	Sharing staff support
	Change in staff-employee specialization	

[a] These examples are adapted from Cook, Shortell, Conrad, and Morrisey (1983).

manage uncertainty and exploit opportunities. Milliken (1990) suggested that examination of managers' interpretations of specific environmental changes is necessary to understand how organizations respond to environmental uncertainty. In small firms, the responsibility for interpreting the environment rests with the manager-owner. The equivalent of the dominant coalition in large firms, the manager-owners' perceptions constitute the intervening link between the environment and the organizations' actions (Child, 1972).

Regulatory and Competitive Uncertainty

Regulatory change that creates potential uncertainty for decision makers in small organizations arises from both new legislation and unpredictable changes in current regulations. Accompanying questions of how legislative changes will affect particular organizations is uncertainty about whether such changes will differentially affect firms in an industry. Frequently, regulation alters a market structure, promoting competitive uncertainty.

Proponents of economic price theory have suggested that regulatory changes directly and indirectly alter market structures (e.g., Birnbaum, 1984). Directly, barriers to entry associated with regulation discourage or prohibit new firms from entering markets by increasing the cost of access. Although ultimately the resulting stabilization in the number of competing firms reduces the level of competitive uncertainty, confusion is likely to characterize the transition period between the introduction of regulatory legislation and the enactment of market barriers. During this interim, opportunistic firms may seek to strengthen their competitive position by capturing benefits inherent in the restructuring process. Firms unable to predict which competitors are apt to engage in such activities are likely to find both the regulatory and competitive environments uncertain and difficult to control.

Indirectly, regulatory changes alter market structures via the costs associated with compliance. These costs range from expenses associated with monitoring the regulatory environment to feelings of frustration resulting from interacting with government agencies (Weidenbaum & De Fina, 1978). At a minimum, regulatory changes translate into increased record keeping and administrative costs. As the price of compliance increases, marginal firms may be forced out of a market, which increases the concentration of competitors. Whereas large firms may be able to minimize or absorb additional costs and corresponding uncertainty, small companies are more likely to experience competitive uncertainty in direct proportion to their erosion in market power.

> *Hypothesis 1: The greater the perception of increased regulatory uncertainty in small firms, the greater the perception of competitive uncertainty.*

Intraorganizational Managerial Response

The first response managers are likely to consider when environmental uncertainty threatens is to seal off their firm's technical core. They assume

that erecting buffers around the production process will absorb uncertainty, enhancing internal operating efficiency (Thompson, 1967). One of the most common buffers firms erect is an information-gathering function for scanning and monitoring the external environment. Hrebiniak and Joyce (1985) distinguished two types of search processes that organizations engage in: "slack search" and "solution-driven search." Firms employ slack searches in situations in which external constraints and dependencies are few and strategic decision making has a long time horizon and few encumbering problems. Solution-driven searches are "directed toward the solution of specific problems" (Hrebiniak & Joyce, 1985: 346) and are used when dependencies are more intractable.

Regulatory uncertainty that evolves from questions about the magnitude and imminence of compliance costs provoke solution-driven searches. When a firm sees an anticipated resource exchange with a regulatory unit as critical, the problem is both specific and immediate. Even though compliance may not yet be mandatory, firms will establish information systems to monitor and potentially influence the regulatory process. Scanning and boundary-spanning activities serve to increase firms' awareness and position them for further adaptive behavior. Boundary-spanning activities represent the least costly strategy for small firms because they can be undertaken at the managerial level without disrupting the central operating procedures of a company (Hannan & Freeman, 1984).

Data indicating that deadlines increase activity further support the contention that small firms will initiate and begin pursuing adaptive strategies when legislative enactments loom (Webb & Weick, 1979).

> *Hypothesis 2: Small firms will consider boundary-spanning activities, which represent the least costly adaptive adjustment, as their first response to regulatory uncertainty.*

Interorganizational Managerial Response

Threatened by environmental uncertainty, organizations attempt to avoid becoming dependent on others and seek to increase their autonomy (Aldrich, 1979; Pfeffer, 1982). Boundary-spanning activities at the managerial level represent such efforts. At times, however, consensus among members of an environmental domain concerning turbulence in an environment may precipitate cooperative efforts among companies. These interorganizational transactions are "simple exchanges, involving equal value given for value received" (Aldrich, 1979: 265). Whereas perceived uncertainty in a competitive environment is likely to position one firm against another, firms are likely to see legislative actions as the encroachments of a common enemy. In such situations, managers are likely to view cooperative efforts that represent reciprocal exchanges as both judicious and cost-efficient.

Economic theories of "rent-seeking" (Buchanan, 1980) support the contention that firms may undertake joint efforts to influence the legislative process along with information-gathering activities aimed at planning future

collaborative strategies. Essentially, rent-seeking actions are those intended
to secure returns in excess of opportunity costs. Investments of time, effort,
or other resources made to protect monopoly privilege by either blocking
barriers to entry or maintaining economic favor are attributes of rent-seeking
behavior. These interdependencies represent reciprocal exchanges. Exam-
ples of reciprocal exchanges at the managerial level include pooling re-
sources to lobby federal agencies, mounting public awareness campaigns to
enlist consumer support, and engaging in joint ventures with noncompeti-
tors like suppliers and clients.

Although firms can enter into cooperative efforts at the managerial level
without disrupting established internal operating procedures, the potential
for reducing self-determination that accompanies any interorganizational
exchange suggests that they consider such interdependencies only after
making initial internal adjustments. Reciprocal exchanges at the managerial
level represent the second least costly adjustment for small firms.

> Hypothesis 3: After making managerial-level adjustments
> within themselves, small firms will respond to regulatory
> uncertainty by considering managerial-level collabora-
> tion with other firms.

Intraorganizational Technical Response

When adjustments at the managerial level can no longer counter uncer-
tainty surrounding regulatory change, decision makers in small firms will
consider altering a firm's technical core to differentiate the organization
from its competitors. Cook and colleagues suggested that the extension of a
technical core into "new stages of production" (1983: 200) allows a firm to
pursue increases in market share, reduce or eliminate transaction costs, and
increase latitude and adaptive flexibility. Small firms may attempt differen-
tiation by changing their product mix, emphasizing particular products or
services, or changing production schedules. Each of these responses in-
volves modifying the throughput or output process. The "structural depth"
(Downs, 1967: 167) at which these changes occur makes mobilization of
resources difficult and costly (Hannan & Freeman, 1984).

> Hypothesis 4: Firms will see intraorganizational techni-
> cal adaptations that differentiate them from their compet-
> itors as necessary responses to regulatory uncertainty
> once they have made managerial-level intraorganiza-
> tional and interorganizational adjustments.

Whereas attempts to reduce regulatory uncertainty at the managerial
level diminish the number of costly technical adaptations firms choose,
threats posed by a competitive environment seldom afford such postpone-
ment. As argued above, changes to a market structure are likely to coincide
with the introduction or even anticipation of new regulatory legislation. The
perceived severity and immediacy of the competitive threat compels man-
agers to bypass less costly managerial adjustments and enhance their com-
petitive position by immediately differentiating products and services.

Thus, although firms will only consider technical changes in response to regulatory uncertainty after they have made managerial adjustments, they will see intraorganizational technical adjustments as a requisite direct response to competitive uncertainty.

> Hypothesis 5: Small firms will consider intraorganizational technical adaptation as the necessary immediate response to competitive uncertainty that accompanies regulatory uncertainty.

Interorganizational Technical Response

Despite their desire to maintain autonomy, organizations cannot internally generate all the resources required for survival. Consequently, it becomes necessary for firms to enter into interdependencies with other environmental entities that jeopardize their dominion. Pfeffer contended "[that] the principal concern motivating integration is the attempt to reduce uncertainty and that this uncertainty reduction will be pursued even at the expense of profits" (1982: 206). Thus, even though interorganizational linkages reduce self-determination, firms will pursue them when necessary.

Having made adjustments at the managerial level and initiated differentiation efforts in response to regulatory and competitive uncertainty, small firms are faced with making the most costly modifications, interdependencies representing the coupling of technical cores. Transactions at this level are not simple exchanges in which individual firms can maintain distinct identities. Instead, technical interdependencies often blur organizational boundaries, even to the point of merger. The costliness of these adaptation responses dictates that managers reserve them until just before their firm is selected out of an environment altogether. Examples of interorganizational responses at the technical level include sharing production facilities or channels of distribution.

Cook and colleagues (1983) contended that such costly options represent interdependencies at the institutional level. The model of small firm adaptation proposed here, however, includes the assumption that the institutional and managerial levels in small firms are collapsed into a general administrative level. For such firms, the most costly options are not those in which liaisons are forged through administrative activities, but transactions at the technical level that result in a coalescence of firms' central operating capacities.

> Hypothesis 6: Firms will consider interorganizational adaptation at the technical level in response to environmental uncertainty only after initiating managerial-level adaptation and technical-level intraorganizational adjustments.

Figure 1, which illustrates the proposed hierarchical cost pattern of adaptation in small firms, summarizes this study's hypotheses. The γ_1 path in Figure 1 represents Hypothesis 1; γ_2, Hypothesis 2; β_2, Hypothesis 3; β_3, the relationship between the adaptation constructs in Hypothesis 4; β_1, the

FIGURE 1
Structural Relationships Among Environmental Uncertainty and
Adaptation Responses
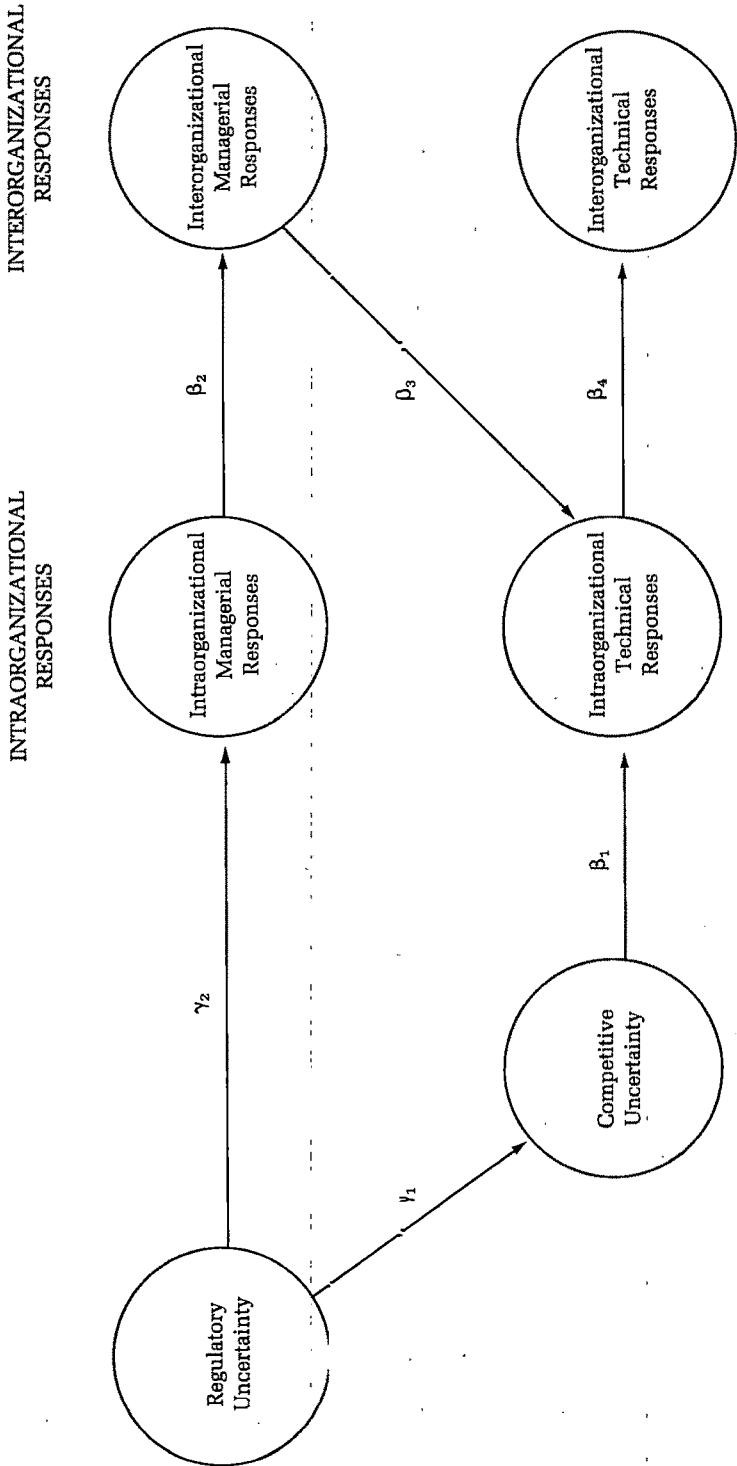
direct relationship between competitive uncertainty and intraorganizational technical responses in Hypothesis 5; and β_4, Hypothesis 6.

METHODS

Data

The adaptation model proposed here is based on the assumption that organizations do not react to every environmental interruption that occurs, only to those likely to cause a magnitude of change in a niche's attributes sufficient to threaten organizational success or survival. Furthermore, the model represents the adaptation of small, but not necessarily young, firms. Thus, data to test the model had to capture not only young firms that were small by virtue of their age, but also those that had chosen to remain small. Organizations run by physicians practicing alone met those criteria.

Two environmental circumstances that pose a threat of potentially critical proportions for such physicians' organizations are the persistent quest of the federal government and private employers to control the growth of medical expenditures and the rapidly increasing growth in the number of new physicians. Essentially, uncertainty in the regulatory environment emanates from physicians having to reconcile whether accession to the fee constraints associated with such government cost-reduction programs as the Deficit Reduction Act of 1984 and the Budget Reconciliation Amendment of 1985 (*Congressional Quarterly Almanac*, 1984; Dingell, 1985; Hadley, 1984) are preferable to the possible loss of patients and income if they don't accept government assignment. Simultaneous with the federal government's establishment of fee schedules, other third-party payers have posed financial constraints. Before 1980, third-party payers were supportive of physicians. "Fee for service" provisions essentially presented a means for reducing the elasticity in fees for physicians' services. Today, that supportive role has changed (McCrackin, 1984). Reimbursement strategies rewarding physicians for keeping utilization and expenditures below some target or financially penalizing them for exceeding those limits are prevalent. In some instances, a physician's acceptance of a payer's terms is necessary for gaining access to a patient pool.

In addition to the threats posed by the cost containment efforts emanating from the regulatory environment, competition in their environmental niche is increasing. Between 1960 and 1985, the number of physicians in the United States more than doubled, going from 259,000 to 541,000 (Coddington & Moore, 1987). Considering the change in the physician-to-population ratio these figures represent underscores the magnitude of this growth. Prior to 1970, there was one physician for every 588 people. In 1980, there was one for every 465 (U.S. Bureau of the Census, 1983a). In spite of this growth trend and the accompanying speculation that the future supply of physicians will far exceed demand, Schwartz, Sloan, and Mendelson (1988) posed a counter argument. On the basis of many of the same data given above but differing assumptions concerning the demand for physicians' services, those authors

projected that by the year 2000 there will be little or no physician surplus. According to them competition will actually decline in the future. The present uncertainty for physicians arises from their inability to predict which interpretation best represents the status of future competition and their need to respond to current competitive changes while positioning themselves for an ambiguous future.

In addition to conflicting information concerning the number of direct competitors, the forms of organizations providing health care are also changing. The emergence of health maintenance organizations (HMOs), independent practice associations (IPAs), competitive bidding, ambulatory care centers, outpatient clinics, and the corporate style assumed by large-group practices all contribute to the complexity of the competitive component. This increased heterogeneity "comes at a time when total patient visits (both at offices and hospital rounds) are down, the number of group practices is increasing, and physicians' real incomes are declining" (*Hospitals*, 1985: 8). There has been speculation that between 1983 and 1986 some physicians experienced a 10–15 percent absolute decrease in income and that they can expect future declines to average from 3 to 5 percent per year (Ottensmeyer, 1986).

Survey Design

Two counties located 90 miles apart in a midwestern state were chosen as the survey framework. I selected the counties on the basis of their similarities and geographical isolation. Their populations were 241,617 and 294,335. The median ages of the citizens were 29.9 and 28.5 years, and mean incomes were $20,212 and $21,760 (U.S. Bureau of the Census, 1983b). In addition to the similarities in socioeconomic conditions in the two counties, the health care environments were also parallel. Five hospitals served each county, three classified as general and two as specialized. In each county, two of the three general hospitals were church-operated (American Hospital Association, 1985). The availability of other forms of health care in the two counties was also comparable. The midwestern location of the state coupled with the geographical isolation of the counties (both more than 100 miles away from a major city) had delayed the infusion of the alternative forms of health care already prevalent in other parts of the country. At the time the data were collected, variations of the new organizational forms had been in the communities for less than six months. The commonalities between the two counties provided a rationale for expecting similar responses from the physicians' organizations within them.

Environmental perceptions and reports of adaptation strategies were obtained from physicians in the two counties via a survey. With the cooperation of the counties' medical societies, whose directors provided membership lists and signed my introductory cover letter, I sent questionnaires to all member physicians in both counties. Recognizing that strategic response is apt to lag behind an environmental jolt, I collected the data six months after the deadline for Medicare-Medicaid's "preferred provider assign-

ments" had occurred. Those assignments were part of the Deficit Reduction Act of 1984, which asked physicians to voluntarily accept an established fee schedule for a 12-month period. In exchange for their participation, physicians were included on a list of "preferred providers" the government supplied to Medicare recipients. The assumption was that Medicare beneficiaries would be encouraged to select participating physicians, saving themselves money and consequently contributing to the cost-reduction efforts of the government program.

In one of the counties, 58 of the 119 physicians working full-time and practicing alone responded to the questionnaire (49%). In the other county, 46 of the 182 physicians in solo practice responded (25%). Although the respondents were representative across medical specialties, with 23 areas represented, the low response rate in the second county raised concerns of bias in the data. Using published data from the American Medical Association (1985), I compared respondents and nonrespondents on three variables: (1) board certification, (2) the length of time elapsed since obtaining a license to practice in the current state, and (3) receiving a medical degree in the state of current practice. No significant differences were found between the respondent and nonrespondent groups in the second county. In the county with the higher response rate, however, one of the three tests revealed a significant difference ($\chi^2 = 4.57$, $p = .03$): respondents were more likely than nonrespondents to have received their medical degree in the state in which they practiced. To the extent that these variables represent the other variables in the study, the generalizability of the findings seems warranted with only slight caution.

Given the basic comparability between the two counties, I merged the data to test the hypotheses. Descriptive characteristics of the combined respondents ($N = 104$) indicated they were a diverse group. The average length of time since they had graduated from medical school was 23.76 years, with a range of 3 to 49 years. The average age of their current practices was 18 years, ranging from less than 1 year to 49 years. The average number of full-time employees in the practices (including medical and clerical employees but excluding the physician respondent) was 2.07, with a range of 0 to 10. The average number of part-time employees was 1.45, with a range of 0 to 8.

Environmental Measures

The following provides background on and examples of the measures. The Appendix gives the complete scales.

Competitive uncertainty. Following previous studies (Bourgeois, 1980; Duncan, 1972; Lindsay & Rue, 1980), I assessed two attributes of uncertainty in the physicians' environment: complexity and dynamism. Previous research has typically conceptualized complexity as a continuum based on the number of entities in an environment and their dispersion across such environmental components as customers, suppliers, and competitors (Duncan, 1972). In the present study, I used that calibration to depict the degree of

complexity within the physicians' competitive niche rather than that in the general environment. The variation of organizational forms comprising the competition was the focus. I expected variation in form to be most apparent when new organizations were designed specifically to take advantage of a new set of opportunities (Hannan & Freeman, 1984). Complexity was assessed by asking the physicians to what extent the types of health-care provider firms with which their practices competed directly had changed during the last six months. The second facet of uncertainty, the rate of change, was simply the extent to which competitive factors in the niche tended to remain the same or to constantly change (Emery & Trist, 1965; Thompson, 1967). Here, the physicians were asked to respond to two items, one on change in the number of their key competitors and one on change in the number of products and services offered by their competitors.

Regulatory sector. Uncertainty in the regulatory environment, seen as resulting from variation in the way the federal government and other third-party payers influenced the physicians' organizations, was measured with two items.

Adaptation Response Measures

The physicians were asked to indicate the significance of 12 different activities to the current strategies of their practices. Seven items tapped intraorganizational activities. Four represented managerial responses that used an organization's present resources and were typically boundary spanning. For example, the respondents were asked how important "designating an individual within the practice to monitor and work with the environment" was. Similarly, they were asked the importance of "attending educational programs that deal with changes in the health care environment." Three items typified technical-level responses involving alterations in actual services provided and representing changes in an organization's technical core designed to retain latitude and flexibility by increasing excess capacity (Hannan & Freeman, 1977). For example, an item assessing the importance of "hiring an M.D. who can offer services the practice doesn't now provide" indicated altering a firm's product line and capabilities, as did an item asking the importance of "performing clinical services within the practice that were previously done by outside firms."

Five items tapped the significance of interorganizational activities. The two managerial linkages included represented simple exchanges in which an organization attempts integration while preserving autonomy. Through an alliance with an HMO or a preferred provider organization (PPO), for example, physicians might attempt to remove demand uncertainty in terms of both fees and numbers of patients. The three items on technical-level interdependencies, which require organizations to forfeit more of their independence, include one on sharing such nonclinical services with other organizations as office personnel, office space, computers, and purchasing.

Unit of Analysis

    Considering the organizations, not the individuals in the organizations, as the units of analysis raised two methodological issues: (1) was using a key informant strategy that relied on perceptions as the data source appropriate? and (2) who best represented organizational traits?

    Studies of organizational phenomena that involve more complex units of analysis than individuals (e.g., strategic management, organizational structure and process) have frequently relied on a key informant strategy. Although researchers have widely acknowledged the problems of using the resulting self-report measures (Houston & Sudman, 1975; Phillips, 1981), at times reliance on this strategy may be the only way to get the information desired (Huber & Power, 1985). Particularly troublesome is common method variance, which may result when a researcher collects measures of two or more variables from the same respondent at one time. When there is no realistic alternative to this strategy, several remedial approaches can improve confidence in findings, two of which I used in the present study. The first is a procedural method, suggested by Salancik and Pfeffer (1977), calling for arranging the items on a self-report questionnaire so that the measures of the dependent variables follow the measures of the independent variable. The second is Harman's single-factor test (Harman, 1967), a post hoc statistical test also used by Greene and Organ (1973), Schreisheim (1979, 1980) and Podsakoff, Todor, Grover, and Huber (1984). The assumption underlying the test is that if a substantial amount of common method variance exists in data, a single factor will emerge from a factor analysis when all the variables are entered together, or a general factor that accounts for most of the variance will result. Here, the results of unrotated factor analyses revealed neither a single nor a general factor. Furthermore, the measures associated with regulatory uncertainty and those associated with competitive uncertainty loaded on separate factors, both of which were distinct from the adaptation factors.

    A related concern when using organizations as the units of analysis is determining who best represents the organizational characteristics of interest. Numerous researchers have expressed concern that comparative organizational research projects have ignored the question of whether members at different hierarchical levels perceive the same organizational characteristics similarly (Bacharach & Aiken, 1976; Lincoln & Zeitz, 1980). The assumption is that where variation exists, relying on key informants at the top of an organization may be misleading (Seidler, 1974). Accordingly, from this viewpoint, representative depictions must depend on aggregate measures across levels. Hannan and Freeman, however, argued that "some organizations are little more than extensions of the wills of dominant coalitions of individuals" (1984: 158). Small organizations whose leaders do not delegate decision authority fit this description. "Such organizations may change strategy and structure in response to environmental changes almost as

quickly as the individuals who control them" (Hannan & Freeman, 1984: 158). Given the dominant decision-making role of the physicians in the medical practices represented in this study, I expected that organizational characteristics simply embodied the physicians' wishes and thus found relying on their perceptions as the source of data justifiable.

RESULTS

The data analysis had two steps: (1) a confirmatory factor analysis to assess the appropriateness of the proposed adaptation model and (2) tests of the associations among the environmental and adaptation constructs specified in the hypotheses through causal modeling. I chose the LISREL program (Jöreskog & Sörbom, 1981) as my analytic tool since it allows simultaneous testing of measurement and structural models and assessment of overall goodness of fit. Table 2 displays the correlation matrix analyzed and the means and standard deviations for each variable.

The first model estimated pertains to the relationships among the strategic response constructs only and therefore does not include environmental indicators. The procedure for estimating the model allowed for the covariances between factors (dimensions) to vary freely. The maximum likelihood chi square yielded by the test was 58.96 ($df = 48$, $p = .134$), with a goodness-of-fit index of .92. Both indexes indicate that the theoretical model fits the data supporting the contention that small-firm adaptation is a multicomponent construct in which responses are differentially intraorganizational or interorganizational and managerial or technical.

Table 3 gives the parameter estimates. As Jöreskog and Sörbom (1981) recommended, I constrained the first lambda for each latent construct to a value of 1 to fix the scales of measurement. This practice does not affect tests of hypotheses but simply aids in interpretation of the measurement model. All the item coefficients are positive and significant. The maximum value of the modification indexes is 3.14. Noteworthy however, is the standardized estimate of .85 for the value of the parameter representing the correlation between intraorganizational technical and interorganizational technical responses. To assess whether the distinction between the two sets was meaningful, I compared the model with a hypothetical one in which a perfect correlation between the two constructs was assumed. The value of chi square for the hypothesized model was 63.58 ($df = 49$, $p = .079$), with a goodness-of-fit index of .92. Comparing the models resulted in a change in chi square of 4.62 ($df = 1$, $p < .05$), indicating that the unobserved constructs are statistically different despite the high estimated correlation.

Table 4 lists parameter estimates from the test of the measurement and structural model with the environmental constructs included. The maximum likelihood estimates corresponding to the measurement portion of the model are high and statistically significant. Similarly, the error terms (the residuals, or random error in measurements, shown in parentheses) are all small. The coefficients of determination, which indicate how well the ob-

TABLE 2
Correlations, Means, and Standard Deviations[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Competitive uncertainty																		
1. Competitors' services	2.60	1.24																
2. Types of competing firms	3.01	1.42	.67															
3. Number of competitors	2.69	1.41	.57	.60														
Intraorganizational managerial																		
4. Monitor environment	2.53	1.38	.21	.22	.27													
5. Outside sources	2.18	1.27	.15	.12	.21	.62												
6. Educational programs	2.92	1.31	.17	.18	.24	.42	.34											
7. Computer interface	1.79	1.17	.19	.11	.10	.55	.45	.28										
Interorganizational managerial																		
8. HMO and PPO alliances	2.65	1.38	.10	.20	.10	.39	.41	.34	.37									
9. Joint ventures	2.91	1.41	.18	.19	.24	.40	.43	.30	.38	.72								
Intraorganizational technical																		
10. Scheduling	2.28	1.33	.25	.29	.40	.49	.28	.36	.43	.57	.53							
11. New physician	1.49	0.93	.18	.19	.12	.26	.29	.05	.40	.24	.21	.43						
12. Adding services	2.06	1.22	.19	.18	.19	.51	.40	.28	.52	.55	.41	.65	.41					
Interorganizational technical																		
13. Nonclinical services	1.99	1.28	.13	.18	.29	.42	.37	.39	.34	.36	.36	.60	.33	.56				
14. Hospital preference	2.18	1.27	.20	.26	.29	.15	.18	.09	.20	.22	.21	.18	.12	.30	.20			
15. Sharing clinical services	2.12	1.35	.15	.21	.20	.27	.17	.16	.21	.30	.26	.45	.29	.43	.55	.12		
Regulatory uncertainty																		
16. Federal regulations' effects	3.53	1.29	.44	.39	.42	.23	.19	.12	.12	.08	.18	.22	.01	.09	.18	.19	.24	
17. Third-party payers' effects	3.14	1.16	.27	.31	.24	.25	.17	.23	.17	.30	.40	.41	.09	.14	.34	.30	.24	.41

[a] Correlations greater than .18 are significant at $p < .05$, those greater than .24 are significant at $p < .01$, and those greater than .30 are significant at $p < .001$.

TABLE 3
Parameter Estimates and Goodness-of-Fit Indicators for the Strategic Response Measurement Model[a]

Parameters	Maximum Likelihood Estimates[b]	Standardized Parameter Values
Intraorganizational managerial		
Monitor environment	1.00	0.83
Outside sources	0.85 (.12)	0.71
Educational programs	0.60 (.12)	0.50
Computer interface	0.80 (.12)	0.67
Interorganizational managerial		
HMO and PPO alliances	1.00	0.90
Joint ventures	0.90 (.11)	0.80
Intraorganizational technical		
Scheduling	1.00	0.83
New physician	0.55 (.12)	0.48
Adding services	0.96 (.11)	0.80
Interorganizational technical		
Nonclinical services	1.00	0.85
Hospital preference	0.31 (.13)	0.26
Sharing clinical services	0.75 (.13)	0.63
Intraorganizational managerial with		
interorganizational managerial	0.46 (.10)	0.61
Intraorganizational managerial with		
intraorganizational technical	0.51 (.10)	0.73
Intraorganizational managerial with		
interorganizational technical	0.43 (.10)	0.60
Intraorganizational technical with		
interorganizational managerial	0.55 (.11)	0.74
Interorganizational technical with		
interorganizational managerial	0.38 (.10)	0.51
Interorganizational technical with		
intraorganizational technical	0.60 (.11)	0.85
χ^2	58.96[c]	
df	48	
Goodness-of-fit index	.92	
Adjusted goodness-of-fit index	.87	
Root square mean residual	.05	

    [a] Scaling parameters were set equal to 1.00.
    [b] Standard errors are in parentheses.
    [c] $p = .134$.

served variables serve jointly as measures for the latent variables, are .99 for the strategic response variables and the competitive uncertainty variables; and .59 for the regulatory uncertainty variables. Thus, the environmental constructs, like the adaptation constructs, appear to have been measured with reasonable precision.

Findings support the hypothesized relationships between regulatory and competitive uncertainty and the hypothesized paths among the adapta-

TABLE 4
Parameter Estimates for the Structural Model[a]

Parameters	Maximum Likelihood Estimates[b]	Standardized Estimates	t
Competitive uncertainty			
Competitors' services	0.97 (.12)	0.80	
Types of competing firms	1.00	0.82	
Number of competitors	0.90 (.12)	0.74	
Intraorganizational managerial			
Monitor environment	1.00	0.83	
Outside sources	0.88 (.12)	0.73	
Educational programs	0.61 (.13)	0.50	
Computer interface	0.79 (.12)	0.65	
Interorganizational managerial			
HMO and PPO alliances	1.00	0.86	
Joint ventures	0.94 (.11)	0.81	
Intraorganizational technical			
Scheduling	1.00	0.86	
New physician	0.56 (.11)	0.49	
Adding services	0.89 (.10)	0.77	
Interorganizational technical			
Nonclinical services	1.00	0.83	
Hospital preference	0.32 (.13)	0.27	
Sharing clinical services	0.75 (.13)	0.64	
Regulatory uncertainty			
Federal regulations' effects	0.70 (.11)	0.53	
Third-party payers' effects	0.56 (.11)	0.54	
Phi	1.00		
Effects of regulatory uncertainty on			
Competitive uncertainty (γ_1)	0.59		5.42
Intraorganizational managerial (γ_2)	0.37		3.50
Effects of intraorganizational managerial on			
interorganizational managerial (β_2)	0.71		5.80
Effects of interorganizational managerial on			
intraorganizational technical (β_3)	0.70		6.54
Effects of intraorganizational technical on			
interorganizational technical (β_4)	0.80		7.45
Effects of competitive uncertainty on			
intraorganizational technical (β_1)	0.25		2.64

   [a] Scaling parameters were set equal to 1.00.
   [b] Standard errors are in parentheses.

tion responses. The gamma coefficient representing the relationship between the environmental constructs indicates that perceptions of regulatory uncertainty correspond to perceptions of competitive uncertainty ($\gamma_1 = .59$, $t = 5.42$). Findings confirm the proposal that when faced with regulatory uncertainty small firms will first consider boundary-spanning, or intraorganizational managerial, activities ($\gamma_2 = .37$, $t = 3.50$). Similarly, findings support the proposed sequencing of responses among the adaptation responses: after initiating information-gathering activities, small firms will

consider cooperative activities with other firms at the managerial level ($\beta_2 =$ .71, $t = 5.80$) and then technical changes designed to differentiate themselves from other firms ($\beta_3 = .70, t = 6.54$). They will consider relationships with other firms that involve sharing technical cores last ($\beta_4 = .80$, $t = 7.45$). Finally, although it is significant, the direct relationship predicted between competitive uncertainty and intraorganizational technical responses is the weakest ($\beta_1 = .25, t = 2.64$).

The overall goodness-of-fit statistic, which indicates whether all the hypothesized relations in a model considered together adequately explain the data, reveals mixed support for the model as specified. The chi-square value resulting from the LISREL analysis ($\chi^2_{113} = 160.23, p < .002$) falls below the .10 minimal probability level for an acceptable fit. However, the ratio of chi square to the degrees of freedom, which is less sensitive to sample size than the value of chi square itself, falls well within the two-to-one ratio considered acceptable (Carmines & McIver, 1981), and the Tucker-Lewis goodness-of-fit indicator achieved the .90 probability level desired with a value of .91 (Bentler & Bonett, 1980). Table 5 shows the incremental fit indexes designed to assess the explanatory power of the competing models.

The maximum modification index associated with the test of the causal model is 9.32. The implication is that relaxing the parameter representing the relationship between the intraorganizational managerial and intraorganizational technical constructs would substantially improve the fit of the model. It appears that adjustments within an organization that modify its technical core and entering joint relationships with other firms at the man-

TABLE 5
Goodness-of-Fit Statistics

Models	χ^2	df	Good-ness-of-Fit Index	p	Difference in χ^2			Tucker-Lewis Incremental Fit Index	Bentler-Bonnet Normed Fit Index
					χ^2	df	p		
Null	797.26	136	.37						
Measurement	354.87	119	.69		442.39	17	.001		
Structural	160.23	113	.86	.002	194.64	6	.001		
Modified structural	150.56	112	.87	.009	9.67	1	.01		
Saturated	142.50	104	.88	.009	8.06		ns		
Measurement compared with null								.59	.55
Structural compared with null								.91	.80
Modified structural compared with null								.92	.81
Saturated compared with null								.92	.82

agerial level are seen as equally viable options once a firm has implemented boundary-spanning and information-gathering activities. Contrary to expectations, costliness does not seem to differentiate the two sets of responses. Modification of the model resulted in a chi square of 150.56 ($df = 112$) and a goodness-of-fit index of .87. The maximum modification index for the adjusted model is 5.55 for the $\lambda_{14,1}$ parameter. Results of the chi-square difference test displayed in Table 5 indicate that improvement of the model is significant ($\chi^2_1 = 9.67$, $p < .01$).

Although adjusting the model results in a substantially better overall fit, and all the associations between regulatory uncertainty and the adaptation activities remain statistically significant, the relationship between competitive uncertainty and intraorganizational technical activities is no longer significant ($\beta_1 = .17$, $t = 1.80$). Seemingly, the perception that technical adaptations and cooperative efforts with other firms are equally viable lessens the direct influence of competitive uncertainty.

DISCUSSION

Data from physicians' practices support the supposition that adaptation in small firms is a multicomponent construct. Results of a confirmatory factor analysis endorsed distinguishing intraorganizational and interorganizational responses as managerial and technical. Although the relationships between adaptive responses and regulatory and competitive uncertainty that emerged separately conformed to expectations, taken together they offered mixed support for the overall model. Subsequent exploratory analyses suggested that intraorganizational technical-level responses may not be as costly as had been expected. The assumption that firms will consider these adaptations only after they have made interorganizational managerial adjustments needs to be reevaluated. Modification indexes suggested that firms might simultaneously consider changes in their product lines or in internal operating procedures and collaborative activities that entail simple exchanges with other firms.

One explanation for that unexpected finding is that there is a need to distinguish "proactive" and reactive strategies in the theoretical underpinning of the costliness continuum. Aggressive strategies in which an organization anticipates environmental change allow investments in flexibility. Having lead time in essence renders such strategies less costly than reactive responses mandated by an environmental change. Coupled with the difference in the costs of competitive (intraorganizational) and collective (interorganizational) responses, this distinction suggests that certain combinations of strategies may overcome the cost differential. For example, the primary cost distinguisher between interorganizational managerial and interorganizational technical responses is the risk of uncontrolled information disclosure. Bresser (1988) argued that whenever organizations engage in collaborative strategies they risk the disclosure of sensitive strategic information. However, decision makers calculating risks must consider the dis-

position of the collective strategy pursued. Proactive collaborative strategies entered into at the managerial level that allow organizations to maintain the secrecy of their strategic plans, thereby forestalling imitation by cohorts (Starbuck & Nystrom, 1981), may be no more costly than reactive modifications made independently to the technical core of an organization, such as changes in the price, promotion, or design of a product. Conversely, reactive collaborative activities at the technical level require organizations to reveal sensitive information about resource availability and allocation that joint venture partners may exploit in positioning themselves competitively. Such interorganizational strategies are considerably more costly than reactive autonomous strategies.

Coalitions of physicians that are being formed across the country to combat the trend toward corporate medical enterprises like the HMOs of the HealthAmerican Corporation provide an example of these cost differences. At risk is the institution of traditional practices that rely on a fee-for-service price structure. Alliances called "Physicians Who Care" are pooling time and money to run advertising campaigns countering HMO advertisements as well as lobbying the Federal Trade Commission (Hull, 1986). Such interorganizational managerial activities expose their participants to information disclosure, but the risk is minimal because the collaboration is voluntary and high levels of formality govern coordination and communication.

Of comparable cost are purchases of computer hardware and software for use in administrative and technical activities in physicians' practices. These purchases, which represent intraorganizational technical-level activities, signal a high awareness of internal efficiency and a desire to offer additional products or services. Many such differentiation attempts are aimed more at retaining market share than at enlarging patient lists. These responses are reactive, intended to competitively reposition a firm.

In the two examples just given, the cost differential hypothesized earlier between intraorganizational and interorganizational strategies is equalized because the risks associated with loss of autonomy in the collaborative activities do not outweigh the urgency of making technical adjustments. However, joint ventures at a technical level, such as physician-owned laboratories, are distinctly different from and considerably more costly than either of these two options. Thousands of physicians seem to have recently bought interests in facilities like diagnostic laboratories, physical rehabilitation centers, and mammography laboratories, to which they refer patients (Waldholz & Bogdanich, 1989). The organizational costs associated with these joint ventures escalate as pressures to participate increase. Waldholz and Bogdanich reported that in some instances physician-investors whose use of these facilities has been low have been exhorted to "increase referrals because the long-term goal of this partnership is the responsibility of each [member]" (1989: A6).

Distribution of the profits or losses of such ventures requires reports of how many patients each physician-member has referred to the center and perhaps other descriptive information about the patients. As such informa-

tion becomes more detailed, individual physicians risk disclosing sensitive information regarding such areas as practice size that other participants might use to enhance their own competitive position. Thus, the relationship no longer represents a simple exchange. Future research is needed to gain insight into the role proactive and reactive response combinations play in the adaptation model proposed here.

Despite the need to adjust the theory regarding the costliness continuum, the present findings call for refinement of the proposed adaptation model rather than its abandonment. Conceptualizing adaptation in terms of multiple sets of activities with varying sequences or cost patterns may overcome the need to categorize organizations as either loosely or tightly coupled to their environment. The sequence of activities and degree of coupling between a pattern of responses and an environment may differ according to the environmental stimulus that is active. The prediction that competitive uncertainty would provoke a somewhat different and more tightly coupled sequence than regulatory uncertainty received mixed support and deserves further examination. In situations in which physicians viewed intraorganizational technical responses as more costly than interorganizational managerial activities, competitive uncertainty exerted a direct and immediate effect. Where the two sets of adaptation responses seemed equally viable, the direct influence dissipated.

Among the conditions that may explain when the different relationships are likely to occur are the density of competition in an environment and the severity of the threat competitors pose. Please recall that new organizational forms of health care had only recently arrived in the communities of the physicians surveyed here. Also, the scale this study used to assess environmental uncertainty questioned the extent to which the number of competitors increased but offered no opportunity to register decreases. Undoubtedly, as competition intensifies and small practices are forced out of the market, the density of physicians in the communities studied will change. As competitors become more heterogeneous and density fluctuates, the association between competitive uncertainty and the pattern of adaptation may become more pronounced.

The recognition that organizations collaborate as well as compete also recommends refinement rather than abandonment of the model. Such an acknowledgment may provide insights on how resource scarcity shapes new species of organizations and broad organizational ecosystems. Since acknowledging that other organizations compose the environment is inherent in the notion of collaboration, the interchange among organizations represents a process of collaborative creation in which each entity attempts to influence the others and thus the shared environment (Morgan, 1986). Alliances among physicians' organizations and other organizations with related interests that have propagated new organizational forms are an example; for instance, alliances between physicians and hospitals have resulted in immediate care centers. Capturing the multiplicity of both environmental jolts and their effects should enhance the understanding of adaptation. After the

current model has been refined, a series of model tests will be necessary to assess the relevance of these suppositions. "Snapshots" across time should render the pattern of development apparent.

Finally, the similarities between physicians' organizations and firms in other industries reinforce the usefulness of refining the proposed model. As movement toward a service-based economy accelerates, many organizations that have historically assumed a professional bureaucracy structure find themselves competing for survival in a free market. Legal firms are primary examples of such organizations. It is unlikely that the dilemmas posed by generalizing previous models of adaptation will arise only in research on physicians' organizations.

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APPENDIX

Environmental Uncertainty

Respondents were asked to what extent the following had changed during the last six months; responses could range from 1 = has not changed at all to 5 = has increased greatly.

Competitive uncertainty. The number of your key competitors; the number of new products/services offered by your competitors; the types of health care provider firms your practice competes with.

Regulatory uncertainty. The extent to which federal regulations affects [sic] this practice; the extent to which third-party payers other than Medicare affects [sic] this practice.

Adaptation Responses

Respondents were asked to indicate how important the following were in terms of the current strategies of their practices; responses ranged from 1 = unimportant to 5 = very important.

Intraorganizational managerial. Designating an individual within the practice to monitor and work with the environment; relying on outside sources for information and advice in planning future activities; attending educational programs that deal with changes in the health care environment; using the computer to interact with other firms.

Interorganizational managerial. Increasing HMO/PPO alliances; participating in a joint venture to offer an alternative health care delivery system.

Intraorganizational technical. Changing patient care scheduling (e.g. extending office hours); hiring an M.D. (s) who can offer services we don't provide; performing clinical services within the practice that were previously done by outside firms.

Interorganizational technical. Sharing nonclinical services with other groups (e.g., office personnel, office space); admitting a larger proportion of patients to one specific hospital; sharing clinical services (e.g., x-ray, lab) with other practices.

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OUTWARD BOUND: STRATEGIES FOR TEAM SURVIVAL IN AN ORGANIZATION

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Using an external perspective as a research lens, this study examined
team-context interaction in five consulting teams. The data revealed
three strategies toward the teams' environment: informing, parading,
and probing. Informing teams remain relatively isolated from their en-
vironment; parading teams have high levels of passive observation of
the environment; and probing teams actively engage outsiders. Probing
teams revise their knowledge of the environment through external con-
tact, initiate programs with outsiders, and promote their team's
achievements within their organization. In this study, they were rated
as the highest performers among the teams, although member satisfac-
tion and cohesiveness suffered in the short run. Results suggested that
external activities are better predictors of team performance than in-
ternal group processes for teams facing external dependence.

Teams are in the midst of a renaissance (Goodman, 1986). Although
teams[1] within organizations are hardly new, they have recently gained im-
portance as a fundamental unit of organizational structure (Drucker, 1988).
Perhaps inspired by the effective use of team structures among the Japanese
and other foreign competitors (Ancona & Nadler, 1989) or by new network
organizational forms that use groups to manage interdependence (Galbraith
& Kazanjian, 1988), U.S. organizations are finally taking groups seriously.

In an attempt to achieve flexibility in a rapidly changing marketplace,
firms have given teams increased autonomy and responsibility (Kanter,
1983; Walton & Hackman, 1986). In addition, firms have made increased use
of cross-functional teams designed to accomplish a particular task and hav-
ing members who have concurrent commitments elsewhere (Galbraith,
1982). Finally, in response to new environmental challenges, organizations
have increasingly called upon teams to span traditional boundaries both
inside firms, where they might provide a closer coupling between functional
units, and outside firms, where they might provide links to customers, sup-
pliers, or competitors (Clark & Fujimoto, 1987; von Hippel, 1988).

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[1] The term teams is used here interchangeably with "groups." Both refer to a set of orga-
nization members who see themselves as a group, are seen by others as a group, and must work
interdependently to achieve a task designated by the organization (Ancona, 1987, Hackman &
Morris, 1975).

Over the past half century, social psychologists have devoted substantial attention to the study of groups. As a consequence, scholars now have a dominant paradigm for the analysis of group behavior. Although this paradigm provides a fine-grained analysis of internal group dynamics, it casts groups primarily as closed systems[2] (cf. Hackman, Brousseau, & Weiss, 1975; McGrath, 1984; Sundstrom & Altman, 1989). But the new teams described above are open systems entailing complex interactions with people beyond their borders.

Paradoxically then, at a time when the social psychological paradigm dominates, organizational groups are facing external challenges not previously the focus of research. There is a consequent need for a research approach that targets external perspectives on group behavior. Although individual scholars have investigated specific questions within this new terrain, no broad paradigm that complements the internal approach has emerged.

If the focus of research shifts outward, new research questions emerge, and old concepts take on new meaning. For example, the question, "How does a group influence individuals?" is supplemented by "How does an organization influence a group?" And, although group cohesiveness can increase commitment and performance (Michel & Hambrick, 1988), previous research taking an external view has shown that it can concurrently inhibit necessary external initiatives (Janis, 1982; Katz, 1982).

Developing an external paradigm will take time. Here, that development process is begun with a few research questions and a few teams. This study posed and pursued its questions in an exploratory spirit, since to document and classify behavior and to posit linkages among variables is the first step in theory development (Gladstein & Quinn, 1985; Glaser & Strauss, 1967).

After presenting an overview of the external perspective taken here, I analyze five "new" teams; these groups were part-time, externally oriented, and more autonomous than has previously been common. My focus is on the teams' approaches to environmental demands, the role of their environment in influencing the teams, and the outcomes associated with the teams' divergent approaches. "Environment" includes both the organization that the teams were part of and the clients outside the organization that they served.

THEORY

An Overview of the External Perspective

Traditional models of group process tend to treat groups as closed systems that act as settings shaping individual attitudes, attributions, and de-

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[2] Although much of the work on group process tends to view groups as closed systems, separated from their organizational context, there are exceptions. For example, work in the Tavistock tradition (Colman & Bexton, 1975) accounts for team interaction with external authority figures and the larger community beyond team borders. In addition, group process models often discuss goal formulation in relation to external demands (Schein, 1988). However, by and large these studies are exceptions to the rule.

cisions (Stephan, 1984). Whether group research has stemmed from the humanistic or the decision-making school of management scholarship or from social psychology, the focus has been on the interaction among group members (Gladstein, 1984). Existing models predict that a group's performance will be high to the extent that it manages its internal processes. However, since organizational groups have high external demands, it is important to extend the theoretical lens from the team boundary outward.

Taking an external perspective captures this outward approach (Ancona, 1987). The focus shifts to a group in its context, and the group is assumed to have an existence and purpose apart from serving as a setting and apart from the individuals who compose it (Pfeffer, 1986). New research questions include "How do organizations influence groups?" and "How do group members map and reach out to their environment?" Like Giddens's (1984) "structuration" model, however, the external perspective does not solely emphasize team initiatives or environmental influence but also looks at the interplay between team and environment. Environments can clearly constrain action, but actors can make a difference, too.

Research from an external perspective does not ignore internal team activities; however, the interest of those taking such a perspective is in the internal processes that influence and are influenced by people in the environment, rather than in decision making or roles per se (Ancona, 1987). Finally, from this perspective teams that can manage their external dependence and obtain critical resources should perform better than those that are only able to manage their internal dynamics (Pfeffer, 1972, 1986; Pfeffer & Salancik, 1978).

Unfortunately, the external perspective remains relatively untested.[3] Although myriad research questions exist, this study addressed three questions, applying them to five consulting teams within a governmental organization. The questions were (1) What strategies, if any, did these teams use to meet environmental demands? (2) What role did their environment play in team-context interaction? and (3) What impact did these external strategies have on the internal processes of the teams and on subsequent team performance?

Team strategies. Previous research has suggested that team members conceptualize group process as two separate sets of activities: intragroup activities and cross-boundary activities (Gladstein, 1984), but scholars still know very little about the cognitions that make up an approach to an environment. More specifically, given five sets of individuals who must provide

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[3] The external perspective builds on a shift in the level of analysis that has taken place in organization theory. Resource dependence, population ecology, and interorganizational theorists have studied organizations as entities functioning within environments rather than as settings for managerial functioning (Aldrich & Pfeffer, 1976; McKelvey, 1982; Whetten, 1983). Studies have shown that organizations not only adapt to environmental demands, but also mold and enact their environments, and manage their dependence on others or fall prey to the forces of environmental selection (Astley & Van de Ven, 1983 .

a service to an external client, positively influence external evaluators, and become a working team, how does each group plan to meet these demands? Given all the possible initiatives they might take toward their environment, what do teams concentrate on?

Previous research has shown that groups develop norms about their task, interpersonal behavior, and group-context interaction quickly, sometimes in the first few minutes of their first meeting (Bettenhausen & Murnighan, 1985; Gersick, 1988; Schein, 1988). Team members bring scripts— sequences of activity to follow—developed from other group experiences to a new group situation (Abelson, 1976; Taylor, Crocker, & D'Agostino, 1978). In other words, a group is not a tabula rasa. Existing scripts include both implicit and explicit strategies that will guide the early actions of the team (Bettenhausen & Murnighan, 1985). The present research sought to document the strategies that the five teams studied used to relate to their external environment.

A series of studies has documented a variety of member roles that link teams to their environments. For example, studies of research and development teams have documented "boundary spanners," "stars," and "gate-keepers," all labels for team members who import technical information from outside the group (Allen, 1984; Katz & Tushman, 1981; Tushman, 1977, 1979). In a study of teams developing new products, Ancona and Caldwell (1988) showed that groups use external contacts not only to obtain technical information but also to map resources, support, and trends in organizations, to influence those individuals with key resources, and to synchronize work flow. Still, it is not known whether these activities are part of an overall plan to meet external demands.

Finally, earlier research has suggested that leaders play an important role in shaping group norms and member behavior. Studies have examined and manipulated leadership styles labeled autocratic, consultative, and democratic to gain insight into such key dimensions of internal interaction as participation (Vroom & Jago, 1974). In the present research, I cataloged leaders' approaches toward their external environment, hoping to uncover key dimensions of external interaction.

The role of environment. I also sought to improve understanding of the role of environment in interaction with the teams. Drawing on Giddens (1984) and the debate between strategic choice and environmental determinism (Astley & Van de Ven, 1983), this research investigated how the five teams approached their environment as well as the constraints it imposed.

Gersick (1988) provided a process model of group development in which environmental influence emerged as a key variable. In a study of eight temporary task forces, she found that groups responded to feedback and information from their environment only at certain points in their life cycles. The groups she studied could be influenced at their first meeting, when they set up their basic approaches to their work, and at a midpoint transition point, when they looked for outside feedback to help them reformulate an understanding of external demands and how to meet them. In contrast, dur-

ing the two major phases of work activity (from the first meeting to the midpoint and from the midpoint to completion), the groups were closed to external influence and did not alter their basic direction (Gersick, 1988; Hackman & Walton, 1986).

Gersick identified a life-cycle pattern of interaction; here, I attempted to investigate team-context influence further. If its environment influences a group by providing feedback about how well the group is meeting demands (Gersick, 1988), how does that influence occur? With what effect? Gersick's research focused on team meetings; here, I also examined other settings in which team-environment relations were forged.

External activities, internal activities, and performance. Finally, researchers still know very little about how external activity relates to internal activity and performance. Most texts designed to help teams function effectively emphasize internal activity such as establishing norms about how to work together and setting boundaries between individuals and groups around issues of intimacy and authority (cf. Bales, 1983; Dyer, 1977; Schein, 1988). From an external perspective, however, teams that manage external demands become better performers (Pfeffer, 1972, 1986; Pfeffer & Salancik, 1978). These divergent approaches raise several questions: Does the development of an external mode of operation interfere with—or facilitate—the development of an internal one? Finally, which set of activities, internal or external, better predicts performance?

PROJECT HISTORY

Early in 1982, a state education commissioner decided to restructure his department to improve coordination among divisions, provide more uniform service across geographic areas, and improve the reputation of the department. He hired several faculty members from a New England business school to help with this reorganization. I taught some organization structure concepts to a design team in the department that then created several design options to present to the commissioner. Once he had chosen a structure, I was permitted to monitor the new regional teams established to work toward the commissioner's goals.[4]

The New Organization Structure

The original organization of the state education department was along functional lines, with consultants—a reading specialist, for example—reporting to one of six division heads in areas such as elementary, vocational, and special education. The new department structure had consult-

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[4] I have assumed that my prior role in the organization did not interfere with my role as researcher. My role as consultant was very clearly confined to the design phase of the reorganization, and at the time of the study I was not on the department's payroll. I had no sense that team members perceived me as an evaluator, or that they distorted or withheld information. Nonetheless, the previous relationship did exist and may have biased the interaction.

ants (who were department employees) reporting to both a functional unit head and a regional team leader (see Figure 1). "Reporting" is something of a misnomer, for the consultants who were the regional teams' members were at the same hierarchical level as the team leaders; however, the leaders had more responsibility and received a small additional stipend. The regional teams acted as generalists, diagnosing and serving the needs of their regions and improving interunit coordination. Thus, team members might go into a school district and interview teachers about their needs for curriculum change and then design a new course to meet those needs.

The vice commissioner supervised the activities of the regional teams, and the functional unit chiefs reported to the division heads, who reported to the commissioner. The head of human resources had the roles of resource person and facilitator and evaluator of the new design.

Implementation

In the fall of 1982, after the design had been selected, the commissioner, vice commissioner, and head of human resources chose regional team leaders from a set of inside consultants who had applied for the position. They also assigned consultants to the cross-functional regional teams, attempting to create teams that had balanced skills. Each team was assigned to a geographic area.

In late December, the entire department met away from its office. The commissioner gave a supportive speech, and the staff members who had helped design the new structure performed skits to illustrate how it would work. Teams began to think about how to serve the needs of their regions and allocate members' time between team and functional activities. Team leader meetings, which would be run by the vice commissioner, were scheduled.

From a research point of view, these regional teams were exemplars of an increasingly popular form of group: they had a *general task*, the *autonomy* to complete that task as they liked, *part-time members*, and *external demands*. Because the teams were *new*, they had to define a role and learn to function with existing parts of the organization. Members had to work *interdependently* to produce a service of importance to the organization. The teams had *formal leadership* and *well-defined boundaries*. Upper levels of management evaluated the teams, which served the needs of an external constituency. Hence, the field was open for teams to define both internal and external behavior. This article traces the process whereby groups managed those tasks.

METHODS

Because this research was exploratory, I used an inductive process to study external activity in the five teams' natural environment. The study was exploratory in that I knew what the key constructs were, but not what the specific variables and relationships among them were. For example, strate-

FIGURE 1
Partial Organizational Chart

gies concerning the environment were of interest, but the components of a strategy could only be induced from team plans, and were unknown before the study.

Teams were composed of six to ten consultants. Most of the consultants, who came from a variety of units, knew each other by sight but had never worked together. Their task was to serve school districts in given geographic areas.

Data Sources

Using a multimethod approach, I followed teams for their first five months.[5] Data collection focused on three sets of variables. First, I collected data on team leaders' plans right after the teams were formed through interviews designed to ascertain implicit and explicit strategies toward their environment. Given time restraints, I interviewed team leaders, assuming that they would most influence the formation of team norms.

Second, I monitored team interactions with outsiders, using questionnaires, logs, interviews, and observation, to document the mutual influence of team and context. Key actors in the teams' environment were the task allocators and performance evaluators in the organization (the commissioner and vice commissioner) and service recipients outside the organization (the superintendents of school districts).

Third, I assessed internal group processes and outcomes to gauge the interaction of internal process, external process, and effectiveness. I collected data on team satisfaction and cohesiveness as well as performance ratings made by outsiders. These external ratings were collected later on in order to allow for lagged effects between process and performance (Gladstein, 1984).

Team leader strategies. In early January 1983, I used a semistructured format to interview team leaders about their plans for the teams. Interviews lasted from one to two hours and were tape-recorded, then transcribed. Questions were general and concerned initial team goals and anticipated early leadership and team activities. The intent was not to prompt talk about external interactions, but rather to assess whether the team leaders themselves raised these issues. If they mentioned external activities (and all of them did), I probed for more specifics about the type of interaction intended.

Team-context interaction. To monitor the mutual influence of the teams and their context from January through May, questionnaires, logs, observation, and internal documentation were used. First, in late February I distributed a questionnaire to all team members containing questions from several sources: Hackman (1982), Van de Ven and Ferry (1980), and Gladstein (1984). These questions addressed aspects of interaction with the regions,

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[5] After five months the summer approached, bringing vacations and a lull in team activity. Therefore, I decided to stop collecting group process data and to return for the formal performance reviews later in the year.

such as difficulty in predicting needs, and aspects of interaction with the commissioner's office, such as difficulty in figuring out management expectations, the extent of team and organization goal congruence, and the amount of communication with upper levels in the organization. The questions, which were all single items, not scales, are reproduced in Tables 2 to 5. Respondents rated the items on 5-point Likert scales. All team members received questionnaires with envelopes to be returned directly to me. I received 17 questionnaires, a response rate of 47 percent.[6]

Second, all team members kept a log of the number of personal visits they made to each school district. The head of human resources required that the logs be kept as input into the evaluation of the new organizational design. Data on two months are reported.

Third, a research assistant and I together observed team meetings throughout the five months, attending an average 2.4 meetings per group. I sat in on 7 of the 9 team leader meetings that occurred and met several times with the commissioner and vice commissioner to get their reactions to the teams' progress. Notes taken during meetings aimed to capture how teams discussed both initiatives toward their environment and reactions to external actions. Beyond this general goal, we followed an open-ended technique using three columns: observations, interpretations, and patterns (cf. Hanlon, 1980).

Finally, throughout the entire period, my research assistant and I asked team leaders to send us agendas, minutes, notes, and other written material originating in their teams; these helped us to track team events. Also, we spent a lot of time simply talking to people in the department to get their impressions of what teams and key external actors were doing.

Team performance. Both team members and outsiders assessed team outcomes. The February questionnaire asked for assessments of group cohesiveness and member satisfaction. In May, right before our observation ended, we interviewed a randomly selected member of each team. This interview was open-ended and focused on evaluating a team's strengths and weaknesses, major activities, and areas for improvement.

The following January (1984), I met with the commissioner and the head of human resources (the vice commissioner had left the organization) for evaluation of the teams a year after their formation. I asked them to rank the teams along the same dimensions used in their formal evaluations and to explain their rationale behind rankings. The head of human resources had collected school superintendents' ratings of the teams, and she gave me these. Her surveys asked whether the team structure had resulted in service that was better, worse, or the same as that of the year before.

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[6] This response rate is low because team members were feeling quite overwhelmed trying to handle their new tasks plus their old tasks. Many team members traveled a lot and were only in the department a few days a week, limiting the time they had available to fill out questionnaires. Finally, this response rate includes the V team, which had only one respondent. Without this group, the figure would be 61 percent.

Data Analysis

Inductive research does not follow an established format of analysis (Glaser & Strauss, 1967; Yin, 1984). In this study, I used what might be called a tracking, multimethod approach that had three components: (1) a content analysis of the team leaders' plans to determine strategies, (2) the development of team profiles assessing internal process, team-environment interaction, and later performance, and (3) an assessment of proposed relationships among the key constructs.

Deriving strategies. Once the interview data were collected from the team leaders, my research assistant and I independently reviewed the transcripts and listed on index cards all references to planned interaction with outsiders. Because of disagreements on what constituted an external interaction, we expanded the classification to include more than team initiatives. For example, we included references to active avoidance of contact, such as a leader's speaking of not wanting to respond to initiatives from outsiders. We included references to both group- and outsider-initiated interactions. Finally, we recorded plans for internal group activity, because those too were part of a leader's overall strategy. Thus, if the key goal for one team leader was fostering communication within the team, and for another it was building a reputation in the field, we learned something about internal and external priorities. These additions allowed us to agree on a set of external interactions for each group.

Once we had index cards for all five groups, we coded each entry on the dimensions it seemed to represent; "frequency of interaction" is an example. Then we identified similarities and differences among the stated approaches. This process led us to group teams into three categories representing different strategies toward their environment.

Developing profiles. We then developed team profiles—short summaries of key processes and performances. In developing these, we were most interested in team-context interaction, particularly with respect to the commissioner's office and the school districts. We kept a log of all project documentation, and whenever we had about 25 new entries we would each review them and discuss how team profiles needed to be changed. A change in a profile might mean reinterpreting earlier data or positing a shift in process. For example, for one team we might write "continued conflict in the team; this seems to be a general pattern," and for another it would be "team seems to be moving from enthusiasm to anger toward the commissioner." In cases in which we disagreed, we tried to understand why and to determine if additional data could help to clarify the issue. Then, looking across team profiles allowed us to document key events in the relationship between teams and their context.

From that point the design evolved. Viewing research as a cognitive rather than a validation process, we continually alternated between concept formulation and data collection (Bailyn, 1977). In the first few weeks in which the education department's new design was in effect, team meetings

were often sporadic, and team members passed considerable amounts of information along to each other between meetings. We seemed to need a questionnaire to tap members' perceptions of external interaction not mentioned during meetings. In the case of a team that had infrequent meetings and the lowest survey response rate, we set up an interview to fill in missing information. When we found that the most information about team-context interaction was communicated during the team leaders' meetings and then transmitted throughout the organization, I decided to attend as many of those meetings as possible. In particular, a meeting held in April became known as the "show-and-tell" meeting and was considered important by organization members because team leaders had to report on their progress for the first time.

In putting together profiles, my assistant and I focused on process and performance information that another source had corroborated. We tried to get independent assessments of what was going on from multiple individuals using multiple methods, including member interviews, management rankings, and superintendents' assessments. For example, the commissioner spoke of one team as a "problem," and team meeting and interview data supported that assessment. In another instance, however, the commissioner noted that a team seemed to be doing very little, but the team leader and members saw themselves as busy and productive. Conflicting reports became part of the data base. We also tried to get data from each group, independent of its early categorization; not knowing whether a team would follow its leader's plans, we did not want to reify the strategies.

Assessing relationships. Our analysis yielded data on team strategies, actual interaction patterns, and performance. Some proposed relationships among these variable sets emerged from numerous discussions and immersion in the data. These await testing by future researchers.

RESULTS

Team Leader Strategies

Our analysis of team leaders' plans suggested they had three different strategies toward their environment. The strategy of *informing* called for concentration on internal team process until the team was ready to inform outsiders of its intentions; *parading* consisted of simultaneous emphasis on internal team building and achieving visibility that would allow outsiders to see that members knew and cared about them; and *probing* stressed external processes, requiring team members to have a lot of interaction with outsiders to diagnose their needs and experiment with solutions. To identify the groups and maintain their anonymity, I have labeled them V, W, X, Y, and Z and assigned the group leaders ficticious names beginning with the letter identifying their group: Victor, Walter, Yurgen, Xena, and Zoro. The following quotations from the initial interviews with the team leaders illustrate the three strategies.

Victor: A Strategy of Informing

Goals. "The first goal is to foster sensitivity to opening communications. We have to struggle with this nebulous goal, struggle with the mechanisms of how we are going to function. This must be done before anything else."

Leadership. "I'll be laid back and let people work, as opposed to being authoritarian and directive. I'll be a facilitator and supportive. My greatest task will be to keep up the enthusiasm of the group."

Interaction with the region. "We need to build our understanding of each other and the districts that we are working in—share our experiences and gather some information about the needs in our territory. We need to gather information, talk about it, digest it, and decide if it is important or not. At first we may have to sift through some very unimportant information until we get a feeling for the kinds of things that are important. Somewhere along the line we are going to need a lot of input and a lot of exchange of information back and forth between the department and the local level. We will want them [the teachers and administrators in the school districts] to know about the school approval [one of the designated interventions in the district] long before we implement it."

Walter: A Strategy of Parading

Goals. "[We need to] develop a team understanding of what we are about, the matrix concept. [I want to] make them comfortable wearing those shoes, comfortable working with each other. Then it will depend on the regions—we won't hit those that are most hurt, but go after major needs that most have."

Leadership. "[My role is] to facilitate, coordinate, inform, smooth. My job is to get the job done within the region, a team member's job is to understand the matrix and work within it so we all function as a smooth operating group."

Interaction with the region. "We have a real need to be visible—to get out in the field and make sure they understand that we are alive, and well, and we have these teams. [We need to] develop a regional profile, sharing the information and perspectives that we have about each of the districts; put that together and synthesize it so that we know what our region looks like. It's a delicate balance putting together a profile; in order to get a truly accurate picture you have to have a historical picture. [We need to] let them know that we are here, but stay away from crises dropped in our laps. [We will] develop our priorities and let them know what we want to do."

Yurgen: A Strategy of Probing

Goals. "I think the first requirement of a team is to become fairly familiar with the region."

Leadership. "I probably have the prime responsibility for selling this concept to the local leadership, superintendents, principals, what have you. Everyone has got to be involved, but I have the most direction."

Interaction with the region. "I think it is going to take a major effort to gain credibility and the methods used are going to have to be tailored to each district. The first task is to get them to express their needs for services. Sell yourself to these people: this is what we can bring you, tell us what your needs are and we will design something to address those. If we do not do this we lose our customers.

"We have each been operating in our own sphere so even though I have knowledge of every district up there, I have been looking at it from one point of view. We all need to broaden our perspective and see what they see their needs to be."

Strategic Differences

One striking difference among the team leaders' strategies was their view of when and how to interact with their regions. Victor's strategy of informing had a primary goal of creating an enthusiastic team with open communications among members and clear group goals. Initially, the level of outside contact was to be low; only "somewhere along the line" did Victor anticipate a lot of interaction with the field. Even when Victor discussed interaction with the districts, he spoke of "sharing our experiences"—the data the team already had—and the need to "sift through . . . information," or to reference data that were written and stored, rather than newly collected. Furthermore, judgments about what was important in the field were to be made by the group's "deciding if it is important or not" and only later communicated to the districts: "We will want them to know about school approval long before we implement it." In short, this team would inform outsiders when it decided what its approach would be.

Walter's strategy of parading ("to march or walk through or around," according to the American Heritage Dictionary) adds to the emphasis on internal team building the need to be visible in the field. Like Victor, Walter wanted his team to work on becoming a "smooth operating group," and like Victor he saw his team as mapping the environment, or "figuring out what our region looks like," by using data that team members already had. Similarly, Walter planned to have his team develop priorities that were then to be communicated to the districts. In fact, Walter intended to stay away from the communication initiated by the districts—"crises dropped in our laps"—that could move the team away from what they planned to do for the majority.

In contrast to Victor, however, Walter planned on a higher level of interaction with people in the field in order to be visible, to "let them know we are here." Xena, who shared this strategy, even more vividly explained this notion of external visibility, saying she would "try and visit all the superintendents, and visit all the schools . . . find out about their unique styles . . . take a different member of the team out each time." She continued, "I want to be able to say that I've been in every building in my region, I want to circulate, to be familiar, to go to superintendents' meetings and be intro-

duced to improve my reputation." Xena, like Walter, directed her team's work in the field toward obtaining visibility, a goal that differentiated the parading from the informing strategy.

Yurgen's strategy of probing called for high levels of two-way communication with the external environment intended to broaden the perspective of team members, to diagnose the region's needs, to obtain feedback on team ideas, and to "sell" the services of the team to the "customer." Yurgen, in contrast to all the other team leaders, saw external activity as the team's first and primary goal. He did not believe his team had all the data it needed to put together a plan. It had information about the districts, but that information was limited in that it had been obtained using a different mind-set. As he said, "I have been looking at it from one point of view," meaning as a specialist rather than as a generalist and consultant.

Yurgen planned to promote a new viewpoint through a very interactive approach with the environment, consisting of hearing the needs of the region ("get them to express their need for services"), then testing whether the team's plans met those needs. A salesperson who is creating a customized product and wants to select the options that will satisfy the customer follows a similar strategy.

Zoro, the other leader with a probing strategy, envisioned a similar widening of team members' perspectives and reciprocal communication with, and action in, the environment:

> Can we move people from their vertical position to being generalists? . . . We definitely need to go to the districts and talk to teachers, principals, administrators, and board people, and say "Are things different now? Are things better? Are you being serviced better over the total educational picture?" We want to be more visible, and we want to find out their needs and develop strategies to meet those needs. We are going to attend the regional superintendents' meetings. Then we will visit superintendents in their home districts and talk to the leadership. We'll establish key personnel and set up communications channels. Whether it is a regional newsletter or some kind of program for special needs, those are things I see us doing straight away. We have to interact as generalists though, not in our own narrow view. So if a consultant is in special education, I'm going to have him go investigate the science labs.

From the outset, team leaders envisioned diverse strategies toward the environment. These strategies differed on several dimensions. First was the amount of interaction that was appropriate, a lot or a little. The second was the method of information gathering to use. Choices were to use existing member information, or to shed specialist perspectives, go into the field, and seek new information as generalists. The third was the type of interaction to have—whether to inform the field of the team's intentions, to become known and observe the environment, or to probe actively and test plans with those outside the team. Table 1 reports our assessment of where each group fell on these dimensions.

TABLE 1
Differences Among Leaders' Plans

Strategies	Teams	Plans		
		Type of Interaction with Environment	Initial Amount of Interaction with Environment	Source of Information Used to Map Environment
Informing	V	Inform	Low	Internal
Parading	W	Be visible	Medium	Internal
	X	Be visible	High	Internal
Probing	Y	Interact-sell	High	External
	Z	Interact-sell	High	External

In short, informing involves plans for low levels of interaction early on, but more later when outsiders will be told of the team's decisions. Parading includes plans for a lot of external interaction for the sake of visibility in the environment. Regional plans for teams following these two strategies would come from information that team members already had or that could be obtained in the department. Probing, by contrast, means a high level of interaction with the environment to revise teams' knowledge of their regions and meet customer demands.

Team-Context Interaction

In the last section, I identified the espoused strategies of the team leaders; here, I report on the actual interaction between teams and their regions and the commissioner's office, and on internal team processes. I begin with an overview of key interactions between the teams and their environment, and then move on to individual team experiences.

Three key events occurred in the relationship between the teams and the environment over the five-month observation period. I considered an event key if there were frequent references to it in team meetings and interviews following its occurrence.

Meetings forbidden. In December, when the leaders had been chosen but the teams had not yet met, Walter, the leader of the W team, scheduled informal meetings of the team leaders so that they could act as sounding boards for each other. When the vice commissioner found out these meetings were taking place without him, he forbade them. The head of the department's human resources office told me that the team leaders were all very angry about this occurrence.

The commissioner structures team activity. In January and February the teams began to generate plans for serving their regions. The commissioner decided that he did not want each team to do different things, so he told the leaders to plan a unified approach. When a few weeks went by and he saw no results, he told the teams to create regional profiles and to develop a workshop that would communicate "promising practices" observed in particular schools to the rest of the region. In a brief March meeting, the com-

missioner expressed frustration with the lack of visible team activity and explained that he wanted something done to justify the reorganization. He then told the vice commissioner to provide more leadership and to keep him informed of what the teams were doing. At this point, the vice commissioner set up what became known as the show-and-tell meeting.

The show-and-tell meeting. At an official team leader meeting in April, the leaders reported on what they had been doing to date. After this meeting, the commissioner, who had been told of its content, contacted the leaders to offer help, advice, or praise. Afterward, when people spoke about teams, they often added such evaluative comments as "the problem team" or "a team that is actually doing something," which they had not done before.

The V Team: A Strategy of Informing

The V team had eight members[7]; our data consisted of one questionnaire, log data, three interviews, one meeting observation, and three notes from the leader showing meeting agendas and minutes. These data, plus numerous observations and discussions with organization members, indicated that the V team had little interaction with its external environment and consequently was unable to diagnose the needs of the region or top management. Internal processes were highly conflictual, and little meeting time was spent planning external initiatives. Throughout the observation period, the V team did not do much informing; it maintained an internal focus.

Interaction with the region. The questionnaire data indicate that the V team had a hard time early on figuring out the needs of its region, and the log data show that it made fewer visits to the region than any other team (see Table 2). The V team also had the lowest response rate to the questionnaire $(N = 1)$, so we interviewed a team member in March. She indicated that interaction with the regions was a problem, reporting that "there are few requests from the schools, and so team members have not gone to visit schools." In May, another team member reported that team members had gone to superintendent meetings, but "just to listen, not to exchange ideas."

Interaction with the commissioner's office. Table 3 reports on the questionnaire items assessing (in February) interaction with the commissioner's office. Of the five teams, the V team had the lowest scores, indicating that its members had a difficult time determining management expectations, formulating team goals that were congruent with organizational goals, and communicating with the commissioner's office.

Two interviewees expressed a negative view of the commissioner and organizational red tape. One team member reported that at their last meeting Victor had said that the commissioner constrained group activity and that meetings with the vice commissioner were a waste of time. In April, during

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[7] Although ten people were formally assigned to the V team originally, in reality it had only eight members who participated in meetings and were full-time department employees. Neither the interviewees nor others in the organization considered the other two people to be team members.

TABLE 2
Interaction with the Regions

Strategies	Teams	"It is hard to predict the needs of our region"[a]	Team Members' Visits to Schools[b]			Total Number of Schools Visited
			1	2 or 3	4 or more	
Informing	V	4.0	1	1	0	2
Parading	W	2.2	2	1	1	4
	X	1.0	5	1	4	10
Probing	Y	1.5	7	1	1	9
	Z	0.7	8	3	2	13

[a] This was a questionnaire item, with responses on a scale in which 1 = strongly disagree and 5 = strongly agree; $N = 17$.

[b] Statistics are from organizational logs and represent the number of schools that received the indicated number of visits.

the show-and-tell session, Victor reported difficulty gaining group member commitment. The commissioner heard that Victor was having problems and asked if he could help. Soon after this meeting, the commissioner began to refer to Victor's team as the problem team, a label that had gained wide acceptance throughout the organization by May.

Internal process. Victor's major goal had been to create effective internal communication and to clarify the nebulous goals that had been handed down. Observation of the team, however, indicated that many of the V team's meetings were canceled because of poor attendance. In addition, the team suffered from poor meeting preparation, high levels of conflict, and challenges to Victor's leadership. At the May meeting, team members expressed

TABLE 3
Interaction with the Commissioner's Office

Strategies	Teams	Questionnaire Items[a]			
		"It is often hard to figure out just what management expects in terms of our team's performance"	"Team goals are congruent with organizational goals"	"The ideas and concerns of our team are communicated to higher levels in the organization"	"[What is] the extent of communication the team has had with the commissioner's office"
Informing	V	4.0	2.0	2.0	1.0
Parading	W	3.3	3.5	3.2	1.5
	X	4.0	3.0	2.5	1.5
Probing	Y	2.0	3.7	3.0	2.0
	Z	2.0	3.7	4.0	3.0

[a] For the first three items, responses were on a scale in which 1 = strongly disagree and 5 = strongly agree. For the fourth item, 1 = very little communication and 5 = frequent communication. $N = 17$ for all items.

dissatisfaction with the team and called for outside facilitation or rotating leadership. At that same meeting, the role of the team was discussed. Victor talked about the need to "develop a plan of action—how can we address the specific needs the department wants to accomplish, get team members to act as ambassadors to the field, and expand the role of school visits?" This agenda clearly approximated agendas that other teams had had months earlier.

The W and X Teams: A Strategy of Parading

Both the W and X teams had seven members; data consisted of seven and three questionnaires, respectively; logs; three and two interviews; four and three sets of meeting observations; and nine and ten notes to us about meeting agendas, minutes, and handouts. The W team did not parade in the regions; it had little contact with them, did not initiate programs, and mapped the environment from existing member knowledge. The team did have a high level of confrontation with the commissioner's office. The X team was very visible in the regions but remained relatively isolated from top management. Both teams had smooth internal processes.

Interaction with the regions. The questionnaire and log data show very different patterns of interaction with their regions for these two teams (see Table 2). The W team had scores resembling those of the informing team; both saw difficulty in predicting the needs of the region and had little interaction with the school districts. In contrast, the X team reported good prediction of regional needs and made more than twice as many visits to the school districts than the W team.

A member of the W team indicated during an interview that "my team is a little different from some of the others because they go out to the regions and we really haven't done that." A final interview in May suggested that the low level of interaction with the school districts resulted from Walter's notion that the superintendents already knew the department so it was not necessary to waste their time with meetings. The respondent noted some frustration on the part of team members because "the field is waiting [for us] and we're waiting to be told [by the commissioner] what to do out there."

Xena and her team members were actively involved going into the districts and sitting in on meetings. She distributed a schedule of 19 district meetings occurring from March to May and assigned members to attend each meeting. As early as February, team members gave some assistance to an elementary school project. One team member questioned the value of going to the superintendents' meetings because they addressed district, not team, agendas. Nonetheless, the X team was more active in the field than the other teams were, and Xena met her goal of visibility.

Interaction with the commissioner's office. The data indexing interaction with the commissioner's office are more difficult to interpret. The W and X teams fell between the informing and probing teams in how they rated the difficulty of determining management expectations, of making group

goals congruent with organizational goals, and of communicating upward (see Table 3). Team W had better scores than team X, but other data tell a different story.

The W team was vocal in its irritation with top management. Walter had set up the eventually banned team leader meetings, and he became overtly resentful over intrusion from above. He complained at the show-and-tell meeting, too, leading other team leaders to wonder if Walter could deal constructively with this issue. Fighting for the power he thought the teams ought to have took up a lot of his time and energy. He chaired the first two official team leader meetings and challenged the vice commissioner numerous times with statements like "How did this deadline get established when we were not asked about it?" Conflict between the two men persisted throughout our observation period. Walter's statement, "We are adults and want to solve our own problems" became a theme that he carried throughout his tenure as team leader. Members of the W team also exhibited some resentment toward the commissioner; one interviewee complained about the "mindless tasks" that the commissioner assigned.

In contrast, Xena, whose team was very visible in the districts, played a very minor role inside the organization. She was quiet at team leader meetings and missed several of them. In her April report to the vice commissioner, she commented that her team members had gotten acquainted and knew regional current events and departmental resources better than before. Yet when we left in May, Xena and her team were still waiting for direction. A member report and observation showed Xena was annoyed at the commissioner's intrusion into the team's affairs, but wanted to be told the department's strategy before preparing a major intervention.

Internal process. Both the W and X teams considered team building a high priority. The data indicate that they did become well-structured, contented groups with facilitative leaders; the only complaint was that they were not doing enough in the field.

At their March meetings, both groups emphasized learning about members' areas of expertise, sharing information on district events from a specialist perspective, and having presentations from in-house people on departmental resources. Both teams developed district profiles, and directions from Walter were to "come prepared to share everything you know about the districts of the day." During team meetings, we noted that both team leaders encouraged open discussion and disagreement, although one or two members sometimes dominated meetings.

The Y and Z Teams: A Strategy of Probing

The Y and Z teams each had six members, and data consisted of three questionnaires from each team; log data; two interviews from each; two and three sets of team meeting observations, respectively; and four and three sets of notes on agendas and minutes. These data, coupled with informal conversation with members, show these teams as the most involved and aggres-

sive both in the regions and with the commissioner's office. Members often met in pairs, and the team met less as a full group than the other teams.

Interaction with the regions. The questionnaire data indicate that the Y and Z teams rated themselves as having a high ability to predict regional needs, and the logs indicate they had more contact with the regions than the other teams (see Table 2), especially team Z. Meeting observations indicate that, of all the teams, their members were the most active in projects and the closest to the pulse of current issues in the field and in the organization.

At the April meeting for giving progress reports to the vice commissioner, Yurgen spoke of great advances on a school evaluation project. The commissioner saw this as a good example of initiation in the field. During a May meeting, each member was told to inform Yurgen of important events in the district. At the April session, Zoro talked about superintendent meetings, events in the regions, and regional activities that his members were involved with, including a communication network he was designing, with one team member assigned to each district. In the May interview, a team member reported that Zoro was frequently on the telephone with the "noisiest people in the district, so at least some of them think we are marvelous."

Interaction with the commissioner's office. Both Yurgen and Zoro were very involved with the commissioner's office. The questionnaire data indicate that teams Y and Z had the highest scores on determining management expectations, formulating goals that were congruent with organizational goals, and communicating with the commissioner's office (see Table 3). When the commissioner formulated and assigned the task of reporting promising practices, Yurgen told his team he would take their comments and suggestions directly to the commissioner, rather than complaining or resisting like some of the other team leaders. He earned a good reputation with the other team leaders and the commissioner's office when he chaired the third team leader meeting, which the leaders rated their best. Yurgen "kept to the agenda while having people participate," one leader noted.

Zoro also initiated activity. When the commissioner did not schedule an organization-wide day for team meetings, Zoro pushed the team leaders to take charge themselves, an idea he planned to discuss with the commissioner. Following the April progress meeting, the commissioner commended both Yurgen and Zoro for being "proactive" in their regions.

Internal process. Team meeting notes indicate that both the Y and Z teams spent most of their time sharing information about current events in school districts and promising practices. In contrast to other teams, members were encouraged to report from a generalist perspective, and there were fewer presentations from in-house personnel on departmental resources. Both team leaders appear to have been more directive than the other team leaders.

Early in February, several members noted that internal communications were a problem in the Y team; members had been missing meetings and often did not know what other members were doing. We observed some improvement at a meeting late in February at which members discussed common

needs in the region. A March meeting showed in-depth information sharing and planning around how to serve the region. Still, Yurgen often communicated one-on-one with team members between meetings. His was a chairman-like style, according to team members; he enabled team members to take initiative: "He gets requests from the field or generates ideas and asks a particular individual to do a piece of the work."

Zoro was also directive. Meetings appeared to be problem-solving sessions; members discussed the aspects of the organization that were hampering their work or how to help a district deal with a problem. At a March meeting we observed, Zoro actively moved members through internal information sharing, workshop planning, detailed reports on regional activities, sample regional profiles, and reactions to his plans. Zoro was also active between meetings. A May interviewee noted, "He makes a determination of what is needed and tries to get the right person to do it. He's a strong leader who knows the steps."

Outcomes

Although it was difficult to evaluate success in the first few months of the project, we did ask members to evaluate their teams in the February questionnaire and in the May interviews.

Internal evaluation. The questionnaire results indicate that the V team's members were the most dissatisfied and the team the least cohesive of all the teams (see Table 4). During the May interview, a member complained that the team had not been able to get anything done because of internal conflicts.

The questionnaire results show that in February the W and X teams had the highest ratings on individual satisfaction and group cohesiveness. Scores were particularly high for the X team. The May interview indicated that this pattern held, but that external activity was problematic. We quote from an interviewee in Walter's group, but these excerpts could be interchanged with comments from the member of Xena's team whom we interviewed: "We're a good regional team. We have a good leader, we have good people, we do our homework, we have information about our region . . . we're a cohesive team, and Walter is a good leader. He's democratic, tolerant of opposition, and handles people well. The only problem is a lack of a specific mission in the field, no sense of priorities."

For the Y and Z teams, which had the probing strategy, satisfaction and cohesiveness scores fell between those of the informing and the parading teams. It was not until May that a Y team member reported, "We're beginning to be more like a team." The Z team member rated his team as doing just what it was supposed to do.

External evaluation. In February 1934, I returned to the department to gather some external performance ratings (see Table 5). I asked the commissioner and the head of human resources to rank the teams on the basis of their performance and to explain the ranking. The commissioner told me that the team concept was finally taking hold. In separate interviews, both the commissioner and the department's head of human resources gave me

TABLE 4
Internally Rated Effectiveness

		Questionnaire Items[a]		
Strategies	Teams	"Group members are satisfied being a member of this team"	"There is little cohesiveness or group spirit in our team"	"The team is effective at meeting individual group member needs"
Informing	V	2.0	3.0	2.0
Parading	W	3.2	1.8	3.2
	X	4.5	1.5	4.0
Probing	Y	3.0	2.0	3.0
	Z	3.3	2.3	2.5

[a] Responses were on a scale in which 1 = strongly disagree and 5 = strongly agree; N = 17.

the same ordering of teams, except that they reversed their top two ratings. Neither respondent thought that the intervals between teams' rankings were even.

Both rated the V team way below all the others, one calling it "the classic case of what not to do." This team was characterized as reactive rather than proactive and as the only failing team. The W team was next to the bottom. It had suffered high turnover. According to the commissioner, the team had deferred to one member who had strong field experience, and this person's information was not always accurate. Walter grew very frustrated with the limitations of his role, abdicated leadership, and eventually resigned as leader. The X team had the next highest rating. Its members were seen as happy and committed, and they satisfied many superintendents. But the commissioner reported that they had not done "a damn thing"; they were just happy to be with each other and to go to superintendent meetings.

The Y and Z teams were both rated much higher than the other teams. The Y team was thought to have done a "super job." The two respondents said that Yurgen was good at "developing the team" and that he "stretches their abilities." They also said "he has in-depth knowledge of the schools, and his school evaluations were a prototype for the rest of the organization." The Z team was considered to have done great work. It did some school evaluations and "told the truth, which made some people angry." "But they did a thorough job with a good end result. The team also assigned people to districts, so there was one person to contact. This has really made a difference," the respondent continued.

The survey the department gave to randomly selected superintendents (see Table 5) did not fully corroborate these findings. Superintendents were asked to compare the service they were now getting to the service available the year before and to evaluate the extent to which they could get the help they needed. The data suggest that although team V lagged behind the other groups, teams X and Z helped the districts most. The commissioner did not credit the survey much, however, because of low response rates. The results

TABLE 5
Externally Rated Team Performance

| | | | Superintendents' Ratings of Effectiveness | | | | | |
| | | | "To what extent can you get the help you need from the department?"[b,c] | | | "How effectively have department consultants met your needs compared to last year?"[c] | | |
Strategies	Teams	Rankings from Commissioner and Human Resources Manager[a]		1-2	3	4-5	More Effectively	About the Same	Less Effectively
Informing	V	5	5	27	27	46	10	70	20
Parading	W	4	4	71		29	29	71	
	X	3	3	100			29	71	
Probing	Y	2	1	70	30		29	71	
	Z	1	2	80	10	10	44	56	

[a] A rating of 1 = best performer and 5 = worst performer.
[b] A rating of 1 = always and 5 = never.
[c] Statistics are the percentages of district superintendents responding in each category.

were not included in formal team evaluations, and a new survey of the superintendents was planned for the future.

DISCUSSION

Categorizing Team-Context Interaction

The first goal of this research was to document leaders' espoused strategies toward their external environment. We were able to differentiate three initial strategies and to monitor the implementation of those strategies. Table 6 presents a summary of strategies, activities, and performance ratings. The informing V team had little outside contact. It made decisions about how to serve its constituents using members' existing knowledge and discouraged initiatives from the field. This approach was intentional, as was the team's concentration on internal team building. But contrary to plan, team V became completely occupied with internal conflicts and never got around to informing outsiders—either the field districts or top management—of its plans for action. The team more or less followed an isolation strategy, not responding to external offers of help and buffering itself from outsiders.

The parading W and X teams were both responsive to only one part of their environment. The W team had minimal contact with its region and relied on existing member knowledge (informing), but through conflict it maintained high levels of visibility within the organization (parading). The X team, on the other hand, was visible in the field observing meetings and practices but isolated from top management.

Both the Y and Z teams planned to follow a probing strategy and did so

TABLE 6
Team Differences in Plans, Processes, and Effectiveness

| Strategies | Teams | External Process | | Internal Process | Effectiveness | |
		Region	Top Management		Performance	Satisfaction
Informing	V	Isolated	Isolated	Conflictual	Low	Low
Parading	W	Isolated	Visible	Consensus	Low	Med
	X	Visible	Isolated	Consensus	Med	High
Probing	Y	Interactive	Interactive	Chairman	High	Med
	Z	Interactive	Interactive	Chairman	High	Med

with all outsiders. They did not use existing member knowledge alone to map their external environment; members were encouraged to take on new perspectives and bring in new data. They had the highest level of external contact, were aggressive not only in testing potential interventions but also in actually implementing new programs, and convinced people in both the field and top management that they were doing a good job.

The data reveal three types of interaction with outsiders—informing, parading, and probing—that differ on key dimensions. The differences are similar to what Daft and Weick (1984) predicted for organizations. Those researchers wrote that organizations differ in the extent to which they intrude on their environment. "Test makers," like probing teams, manipulate the environment; they "leap before they look, perform trials to learn what an error is, and discover what is feasible by testing presumed constraints" (1984: 288). This approach allows for accommodation to a complex, changing environment. In contrast, "test avoiders," like parading teams, are more passive; they accept the information that their environment provides, thus limiting their perspective. Informing teams are even more isolated.

The data presented here provide some empirical support for Daft and Weick's framework, but at the group level of analysis, suggesting the existence of a multilevel construct (Rousseau, 1985). Also paralleling organizational research (Dutton & Duncan, 1987; Dutton & Jackson, 1987), these data suggest that an environment is not an objective entity to which a group adapts. Instead, the cognitive models and skills of the leader of a group influence external strategies, which in turn influence how an environment is perceived and approached.

The Role of Environment

The second research goal was to examine team-context influence. The discussion above describes groups as free actors following a chosen strategy toward their external environment. In reality, this picture is much too simple. An environment reacts to a team, and then both team and context influence each other. The interactions between a group and its environment have patterns similar to the patterns of interaction between the members and the group itself.

The themes of power and influence appear to play an important role in group-environment relations. Teams begin to act and, through their actions, top management comes to a clearer idea of what it wants the teams to do. For instance, here team leaders planned interventions in the field, and then the commissioner realized that he wanted a unified approach. When top management is not clear about team goals but wants to do *something*, active teams have a distinct advantage. As top management begins to understand what it wants, it sets constraints and provides direction. In this study, the teams had differing responses. Walter tried to fight the direction and got caught up in a power struggle, and Yurgen tried to shape management directives.

When negotiating over who is in charge, what the task will be, and how performance will be judged, both teams and top managers may become ambivalent over control. Some teams resist interference but want to be told what to do. Here, the commissioner said the teams had autonomy, but constraints appeared almost immediately. Given the commissioner's ambivalence in this case, it may have been inevitable that one team became the scapegoat and others were able to shine.

Thus, an environment influences a team by setting limits on activity and by picking particular teams as models defining the task and performance. In this case, autonomy was easily talked about but not often provided. A team can influence its environment by promoting its activities as the ones that should shape the definition of task and performance. Teams are not equally skilled in this influence process.

External environment plays yet another role: that of echo chamber. Early in the teams' existence, not much concrete information was available, so the teams were not labeled. Yet when the commissioner felt that enough time had elapsed that output should have been visible, a formal review was set up. After this review, information about how the teams performed and what top management liked got fed into the rest of the organization and amplified. The V team's troubles were reported to the team leaders and the vice commissioner, but the commissioner and the rest of the organization also heard about them. The V team was surely in trouble then, because it now had a reputation. On the positive side, when the Y team was praised as a model for school evaluation and the Z team was congratulated for telling the superintendents the truth, the news reinforced a positive image, making it easier for the teams to continue on the right track. Thus, the first time there is comparative, evaluative information—even if it is based on limited data—it becomes big news.

Since an environment changes whispers into roars, teams must manage the information and images they send out. These images appear to get cast in concrete—here, the initial reputations were intact a year later despite efforts to change them, and indeed new data were interpreted to support the images; for instance, the superintendent ratings were discounted. Different parts of an environment do not necessarily have the same perceptions and evaluations of a team. In this case, top management, not the customer, had

the largest impact on team evaluation and future promotion, making it a key constituent to influence.

Process and Performance

Perhaps the most intriguing finding of this research is that external behavior seems to have a large impact on team performance ratings. If I had predicted performance using the traditional internal model, teams V, W, and X would have seemed prime candidates for top ratings. Their leaders planned to be participative and to engage members actively in debate and decision making. Goal clarity and member satisfaction were seen as important. Yet the V team failed, and although members of the W and X teams rated their satisfaction as high early in the observation period, after one year top management rated the performance of the Y and Z teams as the highest.

The study's key proposition is this: outsiders will rate teams that depend on outsiders and face new, unstructured tasks as the highest performers if the teams emphasize external probing. Such teams can understand outsiders' demands and initiate field interventions. They do not presume to understand their constituents, but rather venture out to revise assumptions in light of a new charter. Those who probe can promote their team and its activities to performance evaluators and customers.

Opening a group's boundaries may have some negative effects on internal processes. The cost of probing in this study was low cohesion and satisfaction in the short run. Interactive external activity takes up a lot of time and brings divergent views into a group, which may inhibit team building. Groups with an external emphasis may run the risk of becoming "underbounded" (Alderfer, 1976)—having external knowledge but not enough cohesion to motivate members to pull different perspectives together. Teams in this study overcame this problem through directive leadership.

A further proposition emerging from this research is that teams that are visible in parts of an external environment but not as active in other parts are midrange performers. Their internal and external activities are more balanced than the highest performers'. Lower amounts of time and identification (or antagonism) with outsiders coexist with internal cohesion and satisfaction. Yet these teams may walk a tightrope between becoming underbounded through emphasizing external demands and becoming overbounded through emphasizing internal demands. In this study, the parading teams approached the latter condition. They risked letting their internal loyalties promote a "we versus them" mentality (Sherif, 1966) and negative external stereotypes (Janis, 1982). Cohesion may be limited to the short term if these teams cannot meet external demands. Still, they meet some external demands by watching outsiders and reacting to their needs. Furthermore, such teams raise the possibility that teams can be both externally active and cohesive.

Finally, the data suggest that isolated teams have a high probability of failing. Although Victor had to contend with a negative reputation and poor facilitator skills in addition to isolation, it is possible that no leader can help

a group isolated from those upon whom it depends. Victor's greatest deficiency may have been using an informing strategy from the start.

In short, I propose that a probing strategy will produce the highest performance in externally dependent teams. For such groups, it appears most effective to emphasize external activities first, even at the expense of short-term cohesion. Early on, these teams can develop a rudimentary structure and some basic capacity to organize themselves to diagnose and serve outside needs. Later, they may be able to develop cohesion based on affirmative interaction with the environment rather than on an ability to get along with one another. Future research will have to test these arguments.

Bounding the Study

This study's findings document strategies toward groups' environments and raise speculations on new relationships among context, team activity, and performance. However, the distinct characteristics of the teams studied may limit generalization to others. For example, a different set of strategies might have developed and been effective under a different set of contextual conditions. One approach to this problem would be to categorize the distinct characteristics of these teams and to hypothesize whether the findings would hold if the characteristics were changed. Further research could then test the hypotheses.

First, one identifying adjective for these groups is "new"; they were new teams, facing a new task that represented a new focus for their organization. Radical change calls for reframing a situation and performing new tasks in new ways (Daft & Macintosh, 1981; Dewar & Dutton, 1986). Thus, one set of hypotheses would be as follows: the probing strategy is associated with high performance in new teams with a new task under conditions of revolutionary change in the surrounding organization, and parading and informing strategies are associated with high performance for established teams with established tasks under conditions of evolutionary change. In addition, leaders who believe their situations involve radical change may be more likely to initiate probing strategies than those who perceive evolutionary change.

Second, the five teams studied faced an environment characterized by an unclear managerial vision, changing degrees of autonomy, external evaluation, and a heterogeneous set of clients. These conditions created exceptionally high external demands. It is possible that the probing strategy fits these high external demands and hence leads to high performance, but parading or informing fits high internal demands. These hypotheses suggest a two-by-two matrix with high and low internal and external demands along the axes. In the future, teams could be categorized and the type of process necessary for high performance tested. T-groups, for example, would be under high internal and low external demands, so internal processes rather than external processes would predict performance.

Third, these teams exhibited a variety of internal and external activities. It is difficult to know whether forceful leadership, updating information about the field, initiating activity, or lobbying for a team's interest to top

management cause probing teams to be rated as high performers, but clearly some mix of these activities makes a difference. Future research is needed to ascertain the importance and impact of these variables.

Implications

This study has both managerial and theoretical implications. For managers, it is clear that team building must be tailored to a group's task. The balance between internal and external focus depends on how much a team needs outside resources, support, or information. Despite the advice of current texts, teams that automatically and exclusively focus inward may be lower performers in the long run. Teams with external evaluators, task-allocators, and clients may find that developing externally focused roles is as important as developing internal process skills (Ancona & Caldwell, 1989). Furthermore, teams need to monitor and manage their external profiles, because the external organization in which they exist will magnify that image.

In the theoretical arena, this study calls for changing traditional group performance models. Prior models (see Figure 2) have posited a general set of group and organizational inputs that directly or indirectly, through the mediation of group processes, influence performance (Gladstein, 1984; Goodman, 1986).

This study, using an external lens, called for specifying the aspects of composition, structure, and context that most influence process and performance and for including a new set of variables in the model shown in Figure 2 (see Figure 3). The results reported here call for highlighting the clarity of managerial vision, the nature of autonomy, and the degree of external demands and change as key aspects of context. Results also suggest including external strategies like informing, parading, and probing and the interaction of internal and external activities as key process variables. Finally, this study calls for including multiple ratings from diverse constituent groups when ascertaining group performance.

FIGURE 2
Traditional Model of Group Performance

INPUTS	TRANSFORMATION	OUTPUTS
Group Composition Group Structure Resources Organizational Context	Internal Process ● Task ● Maintenance	Performance Satisfaction Adaptation
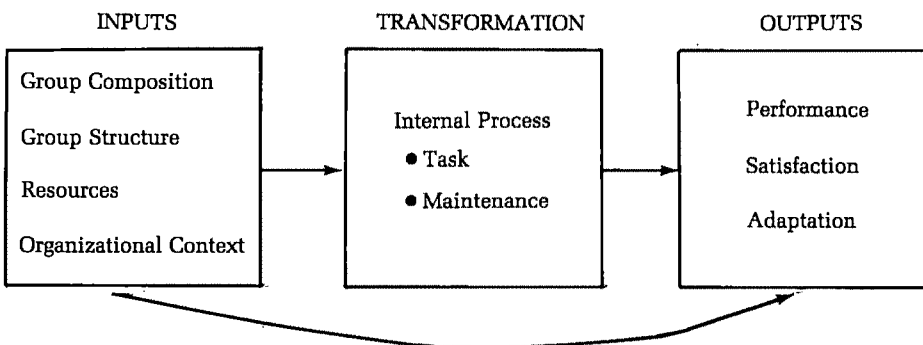
FIGURE 3
Revised Model of Group Performance

| INPUTS | TRANSFORMATION | OUTPUTS |

| Group Composition
● Members' task experience
Group Structure
● Group age
Organizational Context
● Extent of external demands
● Clarity of managerial vision
● Autonomy given to teams
● Degree of change in organization | Internal Process
● Task
● Maintenance

External Strategies
● Informing
● Parading
● Probing | Performance
● Rated by team
● Rated by outsiders

Satisfaction

Adaptation |

The causal directions in the traditional model also need to be changed. The current results suggest investigating the mutual influence of environmental constraint and team action. They imply that there is a very influential feedback loop from performance back to inputs and processes. Unlike Gersick's (1988) findings, in which teams could reshape themselves following external feedback, this study's findings suggest that early labeling of performance by management results in the organizational entrenchment of those labels and inertia in teams.

The findings of this study come from a small number of teams—five groups within one organization, doing one task. But the teams in this study shared traits with many organizational groups. New product teams, organizational task forces, and strategic decision-making groups are examples of teams that face unstructured tasks and high external demands. The study of all such teams may require use of a new theoretical lens highlighting interaction between teams and their contexts.

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DEVELOPING A CLASSIFICATION STRUCTURE OF ORGANIZATIONAL PROBLEMS: AN EMPIRICAL INVESTIGATION

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Many conceptual frameworks have been proposed that identify categories of organizational problems, but none have been empirically developed. In response, this study elicited examples of problems from practicing executives and produced a problem structure identifying common problem categories and their interrelationships. The structure provided a means to examine eight conceptual problem frameworks, and that process revealed some support for two. Compared to extant frameworks, the empirical structure offers greater refinement and an expanded delineation of problem categories as well as revealing some interesting patterns in their interrelationships.

Substantial empirical evidence supports the notion that executives spend much time identifying and attempting to solve problems (e.g., Mintzberg, Raisinghani, & Theoret, 1976; Nutt, 1984). In fact, most of the current management literature takes for granted that executives regularly experience problems and that accumulated experience in so doing is an asset as long as it does not become restricting or debilitating (cf. Langer & Imber, 1979). Researchers have suggested that the way an executive interprets a problem situation substantially affects subsequent information processing, decision making, and behavior (Dutton & Duncan, 1987; Dutton & Jackson, 1987; Kilmann & Mitroff, 1979; March & Simon, 1958; Pounds, 1969; Tversky & Kahneman, 1981).

Interpreting a situation as a problem is a function of a person's knowledge (cf. Pounds, 1969) and the perceived characteristics of the situation confronted (Cowan, 1986; Lyles, 1981). A problem results from individuals' determinations that a discrepancy exists between their conceptions of current reality and a desired state of reality (Downs, 1967); thus, problems are conceptual entities (Smith, 1988). This dynamic highlights the importance of an evoked problem concept in directing attention (Volkema, 1983), in cuing related knowledge to assist interpretation (e.g., Alba & Hasher, 1983),

and in constraining search and solution activity (Taylor, 1975). Once exec-
utives categorize a situation as a particular problem, causes are related to the
initial categorization (Schwenk & Thomas, 1983), as are reformulation (Bass,
1983), the search for solutions (Katz & Kahn, 1978; March & Simon, 1958;
Volkema, 1986), and management performance (Nadler, 1983).

Researchers have begun to focus attention on executives' interpretations
of particular categories of problems (Cowan, 1988) and on characteristics
associated with particular problems and issues (Dutton, Walton, & Abraham-
son, 1989; Jackson & Dutton, 1988; Lyles, 1987). These studies have at-
tempted to clarify linkages between the language used to communicate cer-
tain concepts and the knowledge accompanying the concepts that guides
interpretation and action. Conclusions have suggested that executives not
only evoke different labels to categorize various situations but that these
categories evoke different descriptions of the processes and outcomes ex-
pected to occur. What has not been forthcoming is an empirical investigation
of the problem categories that executives conceive and the language they use
to communicate situations as problems, even though authors have proposed
conceptual problem-classification frameworks for over 30 years (Dearborn &
Simon, 1958). The frameworks have stimulated some empirical work show-
ing that the proposed classifications affect information processing and per-
formance (e.g., Walsh, 1988; Walsh, Henderson, & Deighton, 1988), but there
has been little integration of empirical results around these conceptual prob-
lem categories and no attempt to build an empirical problem-classification
structure.[1]

In response, this study aimed to fill the empirical void that existed
regarding the classification of organizational problems. The study was de-
signed to be primarily descriptive, given the status of knowledge in this area
(cf. McGrath, 1979), for "without adequate description, we would not have
models that connect with the world that man perceives and about which he
theorizes" (Dubin, 1978: 219). Specifically, I addressed two research ques-
tions: (1) what is the underlying structure of organizational problems as
executives conceive them? and (2) what are the labels, or words, that exec-
utives use to communicate distinct problem categories? Together, answers to
these research questions provide both the basis for an empirical investiga-
tion of the conceptual problem-classification frameworks proposed to date
and an empirical foundation contributing to the conceptualization and mea-
surement of organizational problems in future studies.

To conduct the study, I asked practicing executives for examples of
organizational problems that they had experienced. Other executives then
were asked to sort those problems, using similarity as the guiding criterion,
and to label each group that resulted from the sorting. I used this method to
generate realistic organizational problems, to minimize researcher intrusion

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[1] I use "structure" to refer to a classification built empirically, in contrast to "framework,"
which refers to the nonempirical classifications that have been proposed.

into the problem comparison task, and to tap executives' natural language (Daft & Wiginton, 1979) for interpreting the problem categories revealed in the data analysis. The data provided a means for identifying the underlying categorical structure of organizational problems and for interpreting the components of the structure in line with executives' problem labels.

THE CONCEPT AND CLASSIFICATION OF ORGANIZATIONAL PROBLEMS

Recent researchers have amended the traditional definition of a problem as a discrepancy (Downs, 1967), or gap (Pounds, 1969), adding the idea that a problem is a discrepancy that is difficult to close and that warrants a place on its perceiver's agenda (Agre, 1982; Smith, 1988). This definition excludes trivial issues and issues considered impossible to manage. Isenberg found that top managers do not think about organizational problems independently, but rather as multiple interrelated problems, writing that "by forming problem categories, executives can see how individual problems interrelate" (1984: 86–87). Thus, organizational problems are important agenda items that relate to each other but do so in ways that are not adequately understood. As a consequence, it is apparent that goals for developing an empirical classification structure should include the identification of both individual problem categories and their relationships.

To date, researchers advancing our knowledge of the problem formulation process have apparently assumed that the problems they were investigating represented the domain of organizational problems. Previous studies have used (1) idiosyncratic problems generated from memory (Pounds, 1969), (2) patterns of coins hidden under inverted cups (Kochen & Badre, 1974), and (3) traffic flow associated with Ackoff's (1969) elevator problem (Herden & Lyles, 1981). An implicit premise of these studies has been that the results are generalizable to other problems, including organizational problems. Missing has been an empirical foundation defining the problem categories with which executives are familiar—the ones they conceptualize and use in labeling and talking about problems. As Schwenk and Thomas noted, "managers become more aware of certain problems and problem types through recognition of patterns or familiar problems" (1983: 243). The content and structure of these familiar organizational problems remains in need of empirical attention.

Various dimensions and classification frameworks have been proposed to help clarify the categorical relationships between organizational problems. For example, theory devoted to problem solving has indicated that problems can be programmed or nonprogrammed (March & Simon, 1958), structured or unstructured (Simon, 1973), focused on human relations or technical matters (Blake & Mouton, 1964), and concern strategic or operating issues (Drucker, 1954). Going beyond specifying particular dimensions, other authors have proposed problem classification frameworks (e.g., Acar, 1984; Ackoff & Rivett, 1963; Dearborn & Simon, 1958; Maier & Hoffman,

1964; Nadler, 1983; Smith, 1988; Taylor, 1974; Walsh, 1988). It is apparent from an investigation of these frameworks, which are listed in Table 1, that intellectual abstraction and synthesis has chiefly guided their development, not attention to the perceptions and conceptions of executives. As Nadler commented, "Typologies of management problems, when suggested at all, focus on technique categories, previous solutions, current organizational activities, or abstract definitions. . . . Do managers think in terms of most of these typologies? 'No' can be the only answer, so management scientists using any of these typologies are on the wrong track . . . for talking the language of the manager" (1983: 15–17). In response, Nadler attempted to loosen these constraints and construct a classification framework based on human purpose and aspirations. His framework helped link management recommendations to distinct problem categories but was still not founded on executives' own conceptions and language.

In general, each of the frameworks outlined above offers something of value to improve understanding of problems and their relationships. For example, researchers have used several of them to help provide a focus for studying the relationships between certain problem categories, executives' functional backgrounds, and subsequent information-processing activities (Dearborn & Simon, 1958; Walsh, 1988). However, the problem categories

TABLE 1
Classification Frameworks of Organizational Problems

Authors	Dimensions of Classification
Acar (1984)	Problem types: outputs of the focal system, transformation process, inputs to the transformation process.
Ackoff and Rivett (1963)	Basic structures: queueing, inventory, allocation, scheduling and routing, replacement and maintenance, search, competition.
Dearborn and Simon (1958)	Problems: sales, marketing, or distribution; clarifying the organization; human relations, employee relations, or teamwork.
Maier and Hoffman (1964)	Problems: type A/Q—high acceptance requirement and low quality; type Q-A—high acceptance requirement and high quality; type Q/A—low acceptance requirement and high quality.
Nadler (1983)	Human purposeful activities: self-preservation, operation and supervision, plan and design, research, evaluation, learning, leisure.
Smith (1988)	Problem types: goal setting, diagnosis, design, description, research, alternative generation, prediction, evaluation, persuasion. General problem categories: state change, performance, knowledge, implementation.
Taylor (1974)	Problem types: resource specification, goal specification, creative, well-structured.
Walsh (1988)	Categories: accounting-finance, human relations, marketing, internal-management, external-management.

used in these studies were derived conceptually and applied deductively to help code data gathered on problem formulation. Though it is possible that three problem categories (Dearborn & Simon, 1958) were adequate 30 years ago, the circumstances confronting executives have become more complex than such a simple framework and its recent derivatives (e.g., Walsh, 1988) suggest. It is likely and probably appropriate that executives now have a great variety of problem concepts and associated words to communicate such concepts and the complex relationships among them.

THEORETICAL FOUNDATION FOR STUDYING ORGANIZATIONAL PROBLEMS

Though stimuli for decisions at the formulation phase may vary, with a decision event conceived of as an opportunity, a threat, or a crisis, researchers have found that people conceive of most decisions as problems (Mintzberg et al., 1976; Nutt, 1984). The importance of categorizing organizational problems derives, however, not only from their frequency, but also from the impact of problem formulation on managerial behavior and performance (e.g., Daft &'Weick, 1984; Dutton & Duncan, 1987; Dutton & Jackson, 1987; Walsh et al., 1988). The theoretical foundation for understanding how problem categories focus and restrict attention is found primarily in theories addressing the role of concepts in cognition As Smith and Medin noted, "We do not perceive, remember, and talk about each object and event as unique, but rather as an instance of a class or concept that we already know something about. . . . Concepts thus give our world stability. They capture the notion that many objects or events are alike in some important respects, and hence can be thought about and responded to in ways we have already mastered" (1981: 1). Thus, executives have the innate ability to use concepts to circumvent limitations of perception and to realize the cognitive economy that they offer.

Schema theories (Bartlett, 1932) and theories of categorization (Rosch, 1975, 1978) have provided insight into the function that conceptual categories play in the minds of executives involved in problem formulation. A schema, which "describes internal knowledge structures that organize information about objects, people, events, and so on" (Jackson & Dutton, 1988: 371), helps explain the categorical assembly of knowledge that enables executives to encode stimuli, guide the search for additional information, and retrieve associated items from memory (Anderson, 1982). Schema theory suggests that, in uncertain or ambiguous contexts, people may reject or distort information if it is not schema-relevant and consistent. Thus, schemata operate in a top-down thinking orientation and offer propositions for verification (White & Carlston, 1983) and the means to fill in gaps in the interpretation of perceived information (Fiske & Linville, 1980). The top-down orientation, however, also restricts understanding so that it is in line with a person's initial interpretation. An implication for problem formulation is that people may mislabel problems (Mitroff & Featheringham, 1974) or let

them go unrealized until it is too late to solve them. Thus, schemata provide a critical link between a particular problem concept and the requisite knowledge that is used, well or badly, to guide subsequent decision-making activity and action.

Categorization theory describes the acquisition and application of labels—the words that identify cognitive categories—for sets of persons, things, situations, and issues that resemble each other (Cantor, Mischel, & Schwartz, 1982). Category labels are thought to be structured hierarchically, with the most general at the apex. For example, the general category "problem" would encompass a more narrowly defined category like "human relations problems," which in turn encompasses specific occurrences. Cognitive categories "help to store information more efficiently and aid communication with others" (Dutton & Jackson, 1987: 78). They enable cognitive economy (Rosch, 1978) and fit well with the way people think, since categories are themselves creations of the mind (Daft & Wiginton, 1979). Together, schema and categorization theories suggest that problem concepts accompany problematic decision situations and that each concept is associated with a problem label used for communication and a problem schema used for interpretation.

METHODS

Participants

Participants in this two-phase study were 133 middle- and upper-level executives enrolled in a two-year executive M.B.A. program at a private midwestern university. Descriptive statistics did not differ for the groups used in phase one and phase two of the study. The executives were from four successive graduating classes of the program and worked for organizations in Indiana, Michigan, or Illinois. Their average age was 39.3 and their average number of years of management experience was 11.8. Seventeen were women, and 116 were men. They represented a wide variety of organizations, including manufacturing firms and firms in the computer, steel and health-care industries, and many functional backgrounds (human resources, engineering, auditing, manufacturing, finance, and marketing). In addition, they held diverse responsibilities and job titles, including manager, general manager, vice president, president, officer, senior supervisor, and director. This heterogeneity was desirable, given the intent of this study, to avoid a focus on idiosyncrasies associated with, for example, a particular functional orientation. Such idiosyncrasies may result when executives necessarily confront the same types of problems repeatedly and think about them in unique ways.

Procedures

Phase one: Generating a problem set. The objective of this phase of data collection was to generate a variety of problem statements representing organizations in general rather a particular one. I asked 59 of the 133 execu-

tives, all potential 1984 or 1985 graduates, to write down an example of an
organizational problem they had experienced recently. No specific direc-
tions were provided to influence the type of problem they might produce.
This process resulted in a preliminary set of 59 problems. To help ensure a
broad and representative range of organizational problems, I borrowed ad-
ditional problem statements from Lyles and Mitroff (1980) and Nutt (1984),
studies in which executives were also required to produce scenarios of prob-
lems they had experienced. Lyles and Mitroff studied 33 upper-level man-
agers from large organizations, and Nutt studied 57 executives "involved in
service delivery (e.g., hospitals, government agencies, insurance companies,
and consulting firms) . . . so a broad representation of decision making was
included" (1984: 417). To keep the number of problems manageable for the
phase two sorting procedure (described below), I mixed the two sets from the
previous studies and randomly selected 21 problems to combine with the 59
original problems to make a set of 80. The additional problems were selected
randomly to avoid bias from invoking particular criteria for selection. I later
discarded 2 of the 59 handwritten problems because illegible portions made
interpretation of the remaining parts unclear. The Appendix lists the final
set of 78 problems.

   Phase two: Sorting the problem set. Each of the 78 problem statements
was typed on a small index card with a number on its back. The second part
of the study, in which 74 executives enrolled as potential graduates for 1986
and 1987 participated, employed a sorting procedure (Bruner, Goodnow, &
Austin, 1956; Miller, 1969) that has been commonly employed in multidi-
mensional research directed at the structure of personality impressions (e.g.,
Rosenberg, Nelson, & Vivekananthan, 1968) and in semantic analysis (e.g.,
Steinberg, 1967). The executives were gathered into two groups for the sake
of convenience and to ensure that each had adequate space in which to
perform the sorting task.[2] They were instructed to sort a randomly shuffled
deck of the 78 problem-statement cards into groups based on similarity.
They were told to make as many piles as they thought appropriate, to list the
numbers of the problems in each pile, and to give each pile a label that others
could identify. The work session was two hours long. Completing the sorting
and labeling tasks took the participants an average of an hour, with extremes
ranging from about half an hour to an hour and a half.

   This sorting procedure was used because previous research has shown
it to be a valid measure of belief structures (Walsh, 1988). It is especially
beneficial for minimizing researcher intervention because it does not impose
a researcher's criteria on the process of sorting. In addition, it allows subjects
to sort stimuli into as many piles as they think appropriate and is easier to
perform than pairwise comparisons when the number of stimuli is large

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   [2] Each person had a work space about three feet deep and four feet wide. Since the dimen-
sions of each of the 78 cards included in the sorting task were one and a half by four inches, this
space easily allowed the participants to sort the cards into as many groups as they desired.

(Takane, 1980). Letting executives assign their own labels to their problem groups helped minimize researcher intrusion and subjectivity in interpreting the dimensions and capitalized on the use of the executives' own language for categorizing organizational problems (Daft & Wiginton, 1979).

Analyses

Multidimensional scaling. The data specifying which problems each executive sorted into each pile were analyzed using a modified version of multidimensional scaling, the MDSORT program (Takane, 1981b).[3] The program identified the underlying structure of the data (Schiffman, Reynolds, & Young, 1981) for the group of 74 executives by indicating significant dimensions and the problems that loaded on each end of each dimension. Specifically, it obtained "a configuration of stimulus points in a multidimensional euclidean space in such a way that the sum of squared intercluster distances averaged over subjects is a maximum under suitable normalization restrictions on the configuration" (Takane, 1981b: 698). With sorting data, "the degree to which a sample of respondents does not sort any two [problems] into the same group provides a measure of the psychological distance between the two [problems]" (Rosenberg & Kim, 1975: 490).

Interpreting the solution. I interpreted the scaling solution using the labels the executives most frequently assigned to their sorted piles. Through counting the frequency of each label, I identified all that two or more executives had used. If a specific problem label, like "management initiated," contained the same word as another label (e.g., "management"), I included the specific label as an instance of the more general one. In addition, I combined different forms of the same root (strategy and strategic) and obvious variations on a theme (customer and consumer). The rationale for employing these labels to interpret the computer-generated solution was based on the expected congruence between the MDSORT dimensions, which explained the most variance in the executives' sorted problems, and the common labels that represented the language most often used to communicate problem categories. Consequently, 11 of the 12 most common labels were logically matched to the 11 groups of problems the computer analysis delineated, the one exception is noted in "Results."

Modeling problem interrelationships. Part of the analysis extended the dichotomous structure provided by the computer analysis to account for interdimensional relationships. My purpose was to describe more accurately the underlying structure. Isenberg's (1984) claim that executives conceive of multiple problems in interrelated ways in part inspired this analytic step. I identified every instance in which a specific problem loaded on more than one of the underlying dimensions and modeled each relationship in an

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[3] The input data were 78 numbers for each executive, ranging from 1 to n, with n the number of groups that an executive formed after sorting the 78 cards. Each number represented the particular group into which a problem card was placed.

attempt to understand the pattern. This analysis does not depend on the number of dimensions interpreted because of a unique property of the MDSORT program whereby the "stimulus coordinates in a lower dimensional solution remain intact in a higher dimensional solution" (Takane, 1981b: 698). Thus, the two dimensions of a two-dimensional solution remain the first two dimensions of a three-dimensional solution, and so forth.

RESULTS

Scaling Solution

Determining appropriate dimensionality. On the average, the executives sorted the 78 problem statements into 7 piles, with 50 executives (about two-thirds) making 6, 7, or 8 piles; the range was 2 to 12. The specific problems sorted into each of these piles became the input data for the computer analysis. My first task in analyzing the output was to determine how many dimensions best fit the data. I used a chi-square test for this purpose, invoking Takane's (1981a) rule for comparing the chi-square value for each solution's dimensionality with twice the corresponding degrees of freedom, which serves as the critical value. By this criterion, a six-dimensional solution was most appropriate for the data, as Table 2 shows.

A follow-up check on the stability or replicability (cf. Stone & Gueutal, 1985) of the six-dimensional solution was made by computing a split-half correlation using the 74 executives who participated in phase two of the data collection. I randomly split this group and calculated correlations using the scaling coordinates for each of the six dimensions. As Table 2 shows, the correlations remained high for dimensions one through five (.971 to .869) and then dropped substantially for dimension six (to .515), indicating that

TABLE 2
Statistics for Dimensions Interpreted in This Study[a]

Dimension	Eigenvalue	χ^2	df	Split-half Correlation[b]
One	.710	6,787.4	561	.971
Two	.563	4,541.8	559	.958
Three	.400	2,804.5	557	.959
Four	.332	2,218.8	555	.865
Five	.288	1,866.7	553	.869
Six	.214	1,319.7	551	.515
Seven	.176	1,059.7	549	

[a] The criterion suggested by Takane (1981a) was employed to determine the appropriate dimensionality. Thus, all dimensions are included for which chi-square exceeds twice the degrees of freedom (the critical value), indicating a breaking point after the sixth dimension.

[b] As a measure of the stability or replicability of the six-dimension solution, I calculated a split-half correlation using the 74 executives who participated in phase two of the data collection. The group was randomly split and correlations were calculated with the scaling coordinates for each of the first six dimensions.

dimension six was not as stable as the first five. However, I decided to keep dimension six as part of the solution since it was significant under Takane's (1981a) criterion and was interpretable; further, the decision had no effect on the other five dimensions, since their coordinates remained the same. Conceptually, the six-dimensional solution means that these six dimensions best represent the aggregate knowledge structure regarding the similarity of the 78 problems for the 74 executives.

Examining the underlying structure. Table 3 shows the six-dimensional MDSORT solution. The variance in the sorted problems explained by these dimensions is 38.8 percent, a typical level for this type of analysis (Takane, 1981a; Walsh, 1988). "The variance explained statistic embodies the degree to which the inter-item distances in the final [MDSORT] solution and the inter-item distances estimated from the original dissimilarity judgments are similar, assessing the quality of this match" (Walsh, 1988: 881). The percentages of variance explained for the six dimensions in the study ranged from 10.8 percent for dimension one to 3.3 percent for dimension six. Table 3 includes the loadings of problems onto each of the six dimensions and indicates positive and negative polarities for these loadings. Seven problems were retained for each end of each of the six dimensions, which provided an adequate basis for interpretation without making it unduly complex. Of the original 78 problems, 45 were components of the solution set. The remaining problems had weaker loadings on one dimension, heavier loadings on an insignificant dimension, or both and therefore were not considered further in the analysis. Each set of problems loading on one end of one of the six dimensions represents a problem category because of the similarity among the problems it contains.

Interpreting the dimensions. Table 4 lists the problem labels, in order of descending frequency, that at least two of the executives used to name one of their piles of similar problems. In six instances, I combined two problem labels because one or more of the executives used the specific combination and each combination made logical sense. For instance, I combined "personnel" with "human resources" and "production" with "manufacturing." Of the total 609 labels assigned, 406 (67%) are included in the arrangement presented. I matched 11 of the 12 most frequently used labels to the problem groups on each dimension, as depicted in Table 3; "accounting" was used instead of "planning" even though three more executives included "planning" because "accounting" more logically fit the problem group to which it was assigned.[4]

Mapping the interrelationships between dimensions. A more detailed

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[4] I acknowledge that using "accounting" instead of "planning" introduces an element of researcher intrusion into the study. I believe this is justified because of the nature of the problems with the highest loadings in this category (cash flow, audit, accounting methods, and budget costs) and because these labels stand at the margin of those included in the set used for interpretation. It is likely that labels not included in this set are important in some contexts, which is an issue that warrants further empirical attention.

TABLE 3
The Six-Dimensional Scaling Solution

Dimensions[a]	Positive Polarity		Negative Polarity	
	Scaling Solutions[b]	Loadings	Scaling Solutions[b]	Loadings
One (.710, .11)	Marketing		Personnel-human resources	
	Market share eroding (12)	.16	Worker bothering co-workers (52)	−.20
	Customer misuse of product (9)	.16	Complaints about pay (70)	−.20
	Sales: changing attitudes (15)	.16	Absenteeism and tardiness (32)	−.20
	Recession and spending (76)	.16	Declining work-group morale (47)	−.19
	Customer satisfaction (59)	.15	Not putting forth effort (49)	−.19
	Customer complaints (8)	.14	Grievance over workload (74)	−.18
	Poor company image (67)	.14	Poor working relations (43)	−.18
Two (.563, .09)	Operations		Marketing	
	Information for data base (78)	.19	Customer misuse of product (9)	−.24
	Data gathering for control (42)	.19	Market share eroding (12)	−.23
	Potential computer uses (61)	.19	Sales: changing attitudes (15)	−.23
	Developing a computer network (64)	.18	Recession and spending (76)	−.22
	Machine malfunctions (36)	.17	Customer satisfaction (59)	−.21
	Imbalance of raw materials (14)	.17	Poor company image (67)	−.21
	Confusion from data processing (60)	.16	Customer complaints (8)	−.20
Three (.400, .06)	Production		MIS-data processing	
	Machine malfunctions (36)	.30	Data base/record keeping (78)	−.24
	Imbalance of raw materials (14)	.27	Computer network (64)	−.23
	Quality control limits (39)	.26	Audit: inaccurate records (10)	−.22
	Outdated machinery (58)	.24	Confusion from data processing (60)	−.21
	Stockouts occurring (17)	.22	Accounting methods (65)	−.20
	Raw material resources (28)	.21	Potential computer uses (61)	−.19
	Shipping quota (31)	.18	New tax legislation (66)	−.18

TABLE 3 (continued)

Dimensions[a]	Positive Polarity		Negative Polarity	
	Scaling Solutions[b]	Loadings	Scaling Solutions[b]	Loadings
Four	**Strategic**		**Customer**	
(.332, .05)	Changing environment and structure (26)	.24	Customer misuse of product (9)	−.30
	Changing the organizational mission (23)	.22	Customer complaints (8)	−.28
	Formulating a strategy (25)	.20	Customer satisfaction (59)	−.28
	Legislation against company (75)	.20	Information for data base (78)	−.23
	Atmosphere and company mission (72)	.18	Computer network (64)	−.22
	Company's future staffing (1)	.16	Potential computer uses (61)	−.21
	Economics: plant closing (13)	.16	Data gathering for control (42)	−.20
Five	**Accounting**		**Communications**	
(.288, .04)	Negative cash flow (11)	.34	Confusion from data processing (60)	−.25
	Audit: inaccurate records (10)	.32	Developing a computer network (64)	−.23
	Accounting methods (65)	.29	Changing the organizational mission (23)	−.20
	Budget costs (5)	.28	Potential computer uses (61)	−.20
	New tax legislation (66)	.27	Formulating a strategy (25)	−.17
	Pricing, service, and costs (29)	.19	Changing environment and structure (26)	−.16
	Reporting procedures (62)	.09	Information for data base (78)	−.15
Six	**Management**		**External-environmental**	
(.214, .03)	Customer satisfaction (59)	.23	Legislation against company (75)	−.43
	Customer misuse of product (9)	.16	Recession and spending (76)	−.31
	Balancing staffing needs (7)	.16	Economics: plant closing (13)	−.27
	Reorganizing staff positions (2)	.14	Sales: changing attitudes (15)	−.25
	Developing a product (56)	.13	Raw material resources (28)	−.22
	Allocating a work force (3)	.13	New tax legislation (66)	−.14
	Maintaining business hours (21)	.12	Information for data base (78)	−.12

[a] The numbers in parentheses are eigenvalues and the percentage of variance explained.

[b] The labels for interpretation the executives most frequently used accompany each dimension. The numbers in parentheses indicate the problems loading on each dimension and correspond to the complete problem statements that appear in the Appendix. Convergence for the solution was reached in 26 iterations; variance explained equaled .38, $N = 74$.

TABLE 4
Problem Labels Executives Used for Identifying Groups of Similar Problems[a]

Label	N > 20	Label	20 > N ≤ 10	Label	N < 10
Personnel-human		Customer	19	Change	9
resources	40	Planning	17	Policies-	
Strategic	32	Accounting	14	procedures	9
Operations	30	Finance	12	Resources	8
Marketing	30	Employee		Performance	7
Production-		relations	10	People	7
manufacturing	28	Technical	10.	Decision making	5
Management	25	Motivation	10	Quality	5
MIS-data processing	24			Legal-regulations	5
External-				Technology	4
environmental	22			Staffing	3
Communications	21				

[a] The problem labels in the table represent specific labels used by at least two executives. In the six instances in which I combined two problem labels (indicated with a hyphen), at least one executive explicitly used each term.

inspection of the six dimensions revealed that many of the problems loaded on more than one dimension, which is typical for a complex information domain (Smith & Siegel, 1967; Walsh, 1988). Intuition suggested that these interrelationships indicated that the dimensions themselves were not telling the whole story about the underlying structure. An obvious example helps elucidate: the set of problems loading on the "marketing" end of dimension one and opposite the "personnel-human resources" end of this dimension is identical to the set of problems on the "marketing" end of dimension two, which is opposite "operations." Rather than ignore these interrelationships, I made them salient to try to understand their meaning. Figure 1 identifies all instances in which a problem loaded on more than one dimension, with each of the problem categories from the six dimensions represented by a labeled oval and each problem shared by two or more categories represented by a single line between ovals.

DISCUSSION

This study built an empirical foundation for investigating organizational problem-classification frameworks. The foundation also provides some direction for integrating empirical results on the problem-formulation process for particular problem categories and for conceptualizing and measuring problem categories in future studies in a manner consistent with what executives conceive. A particular challenge in building the empirical structure was to try to reflect the complexity inherent in this domain (Dubin, 1978) by examining the relationships among problem categories. Figure 1

presents an integration of the results from the study. It includes information regarding (1) the underlying structural dimensions, containing the problem categories, of the sorting data, (2) the problem labels that the participating executives employed, and (3) the relationships between problem categories.

As is visually apparent, the central core of the structure in Figure 1 is a star formation. The five categories at the points of the star share problems with relatively indeterminate characteristics, so the distinctions between the categories are unclear. Each of these five includes problems with sufficiently similar characteristics to enable classification as a unique category. Each also contains overlapping problems with lower "cue validity"[5] (Reed, 1972: 385), as shown by the executives' relative inability to discriminate between categories when grouping them on the basis of similarity. These conditions would likely imply a high degree of disagreement between executives involved in defining such problems. The incorporation of multiple perspectives to ensure a more representative understanding (Mitroff, 1983, 1987) would perhaps aid executives involved in the formulation of problems with indeterminate characteristics but would also be likely to ensure disagreement. It is interesting to note that the most related problem categories do not include the business functions of production, accounting, and marketing. The more highly related problem categories may be those in which executives generally remain less involved, suggesting that their level of shared understanding is less precise. This implication deserves further empirical investigation because it affects both problem-formulation and communication processes.

Comparing the categories in the star formation with the rest of the categories in Figure 1 calls attention to a hierarchical pattern in the numbers of category interrelationships, ranging from no relationships for "personnel-human resources" to 16 relationships each for "MIS-data processing" and "customer." This range reflects important distinctions between the clarity of problem categories and the level of shared understanding accompanying each. Thus, there appears to be no ambiguity inherent in problems comprising the personnel-human resources category and little ambiguity associated with problems related to the primary business functions but considerable ambiguity regarding category membership for problems contained in the central categories of the structure. Whether this finding is related, for example, to the organizational level of the executives studied or to the impact of their M.B.A. curriculum are important and worthy considerations. It is possible that the structure and content of executive M.B.A. programs affect how people frame and interpret organizational situations and indeed such an effect is probably likely. It is not clear, however, if executives acquiring M.B.A. degrees significantly differ from other executives or in what ways they could be expected (and perhaps hoped) to do so. The avenues for

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[5] "The validity of a cue is defined in terms of its total frequency within a category and its proportional frequency in that category relative to contrasting categories" (Rosch & Mervis, 1975: 575).

FIGURE 1
Organizational Problem Classification Structure

empirical studies of such questions are both attractive and fundamental; they deal with critical issues of concept formation and the development of knowledge structures, both of which are tied directly to learning.

Several particular relationships are also noteworthy in the problem-classification structure. First, the category external-environmental shares problems with eight other categories and thus has three more ties than any other category, which implies that more problems in this category have conceptual characteristics enabling them to share membership in other problem categories that are themselves very different—"operations" and "marketing," for example. Thus, although some characteristics of the problems that overlap the boundaries of these categories evoke an orientation external to the organization, other characteristics evoke an orientation toward a particular organizational aspect. This pattern may, in the minds of these executives, have paralleled the perspective of Lawrence and Lorsch (1969), who claimed that different relationships exist between various parts of an organization and their respective environments. Second, four of the remaining problem categories overlap only with the external-environmental category and with one, or in one case two, other unique categories. The strategy, production, accounting, and marketing categories all share problems with "external-environmental," and "strategy" overlaps with "communications," "production" with "operations," "accounting" with "data processing," and "marketing" with "customer" and "management." On the one hand, this pattern indicates that the cue validity is higher for problems in these categories than for those previously mentioned, but on the other hand it suggests the importance of identifying a problem structure (cf. Isenberg, 1984) rather than paying attention only to particular dimensions. If that had been done, information like this would have remained hidden. Relationships of this variety warrant further investigation, to understand both why these categories (three of which are business functions) have unique links with the more indeterminate categories and why they consist of problems with greater cue validity than those other categories.

Aside from the problem structure itself, it is worth noting that Table 4 reports problem labels that are not included in Figure 1. Though in all but one previously mentioned instance the executives assigned these labels less frequently than those included in the figure, the excluded problem labels represent distinct categories that some executives shared and that therefore should not be ignored. It is possible that these problem categories are subsets or "supersets" of other categories and thus represent a different level of a hierarchical structure (cf. Lord, Foti, & Phillips, 1982; Tversky & Hemenway, 1983). Whether that is the case or not, these additional categories may be particularly important in certain contexts and especially meaningful to various subsets of the executives included in this study. Though addressing this issue is beyond the scope of this study, raising it suggests a need for further investigation of the content of the problem categories included in the structure and the way variables like job function, industry context, and training affect them. In addition, the generalizability of this particular problem struc-

ture needs to be empirically examined across organizational levels (cf. Ireland, Hitt, Bettis, & de Porras, 1987). Further, it is worth noting that problem labels used very infrequently, including those that were used only once and therefore do not appear in Table 4, are probably idiosyncratic terms related to a particular executive's personal uniqueness, specialized training, and so forth. This explanation may also account for the inclusion of some problems in the sorting task but not in the underlying structure of categories common to most of the executives. However, these issues and explanations pose empirical questions for further pursuit; addressing them could help identify relevant cognitive differences that executives bring to these increasingly dynamic and interrelated situations.

Overall, the results offer a structure for better understanding the categories into which executives classify organizational problems. The study does not, however, explain the process of categorizing individual problems, which would require greater attention to the particular problem characteristics that affect an executive's attention (cf. Jackson & Dutton, 1988). On the other hand, the study does offer a foundation for integrating empirical results about the process of problem formulation and the related process of learning how to manage different types of problems. In addition, the organizational problem-classification structure can serve as a stimulus for investigating how well particular problems fit into specific categories. What is it about some problems and problem categories that makes them indeterminate, and how does indeterminacy affect the adequacy of communication about them, the level of political activity involved in their formulation, and the likelihood of their reformulation? Answers to questions of this nature may help provide a better understanding about problems that get misclassified (Mitroff & Featheringham, 1974) and how organizations can design processes to minimize the negative effects of misclassifications. It could also help provide a better means for linking problems from specific categories to processes involved in their formulation, such as information search (Dukerich & Milliken, 1987) and the negotiation of interpretations (Walsh & Fahey, 1986).

Comparison to Previous Problem-Classification Frameworks

As Table 1 shows, researchers have offered a substantial number of conceptual frameworks intended to capture the differences among organizational problems. The classification structure resulting from this study, though distinctively different from any of the theoretical frameworks, has some similarities to two of them. This study provided empirical evidence for the existence of each of the categories suggested by Dearborn and Simon (1958) and by Walsh (1988), except for Dearborn and Simon's "clarifying the organization." It is likely that those authors proposed that particular category as a catch-all for whatever did not fit into their marketing and human relations categories. Walsh's decision to expand Dearborn and Simon's framework seems to have been a step in the right direction, since part of the classification structure from this study mirrors each of Walsh's categories.

His accounting-finance, marketing, and external-management categories clearly relate to this study's accounting, marketing, and external-environmental categories. The differences are that the executives included in this study distinctly labeled "accounting" and "finance" and did not lump "management" with "external-environmental." Further, although there was evidence for Walsh's human relations category, the executives in this study made greater distinctions by separating personnel-human resource problems and employee relations problems. Walsh's remaining category, internal-management, was reflected directly in this study's management category and perhaps indirectly in the operations category.

The results offer very little evidence to support the other problem frameworks (Acar, 1984; Ackoff & Rivett, 1963; Maier & Hoffman, 1964; Nadler, 1983; Smith, 1988; Taylor, 1974), which appear to be more abstract than the structure built from executives' conceptions. They do not reflect the natural language of the executives studied here or the categories those executives evoked, even though they may have potential value. Such conceptual frameworks may assist in the diagnosis of a problem situation once it is understood what category of problem is being experienced. For example, Nadler's framework may help link problem formulation to intended actions, if the appropriate relationships can be made between the category of problem being confronted and the human purpose in his design. Similarly, Smith's (1988) conceptual framework may help focus attention on unique aspects of problem formulation within the context of a particular problem category if the time and effort to do so can be empirically justified. Overall, in comparison to the conceptual frameworks, the empirical classification structure offers categorical expansion and refinement, the use of executives' natural language, and the specification of structural relationships among existing problem categories.

Implications for Practice and Future Research

One implication for using an empirically derived organizational problem classification structure relates to training for and practice in problem diagnosis. Since problems themselves are conceptual entities (Smith, 1988), an individual's problem categories are inevitably formed through the learning and information processing that take place regarding members of specific categories (Rosch & Mervis, 1974). The implicit theories, or schemata, accompanying problem categories are also learned (Fiske & Linville, 1980; Sternberg, 1985b). Thus, many of the theoretical relationships involving organizational problems "need to be discovered rather than invented because they already exist, in some form, in people's heads" (Sternberg, 1985b: 608). The degree to which people involved in or learning problem formulation can capture those relationships should enhance their understanding and enable them to learn more efficiently and perhaps more effectively (Donnellon, 1986). As Alba and Hasher noted, "A critical condition for the acquisition of new knowledge is the existence of previously acquired relevant knowledge" (1983: 205). A structure of organizational problems can serve as

a beneficial tool for those practicing and enhancing diagnostic skills as well as for those involved in problem formulation.

Overcoming the limitations of this study and extending its horizons could further those ends. It is worthwhile remembering that this study's participants were executives pursuing executive M.B.A. degrees. Thus, the results cannot automatically be generalized to other executives, nor should they be. Further research should determine the extent to which the scope and orientation of these problem categories are related to knowledge attained through the curriculum of an M.B.A. program rather than through experience. Generating classification structures from executives who have never pursued an M.B.A. and from M.B.A. students with little or no executive experience might be revealing. Such a study would provide information for comparison with the results from this study and could help address some of the potential influences of M.B.A. programs. Linking knowledge of this type with managerial performance and making comparisons between executives with M.B.A.'s and those without should help scholars understand our efficacy as educators of executives and the relevant differences between formal learning and learning from experience (cf. Sternberg, 1985a).

Aside from the issue of its participants, it is important to note that this study involved written descriptions of problems that executives had experienced. Written information is an important medium in any organization, since executives inevitably discover and interpret most problems through communications provided by others rather than through their own perceptions, but using written descriptions excludes other communication possibilities as well as direct perception. Thus, generating structures of problem categories from directly perceived problems might lead to different results, which would enhance our understanding of problem categorization and formulation. For example, directly perceived human relations problems may depend on different stimuli (or problem characteristics) than problems made salient through the written communications of others. Studies using videotaped scenarios may be able to capture a dimension of organizational problems that eluded this research. It might be useful to expand the type of communications evoked to include verbal as well as written media, incorporating, for example, auditory feedback from telephone or face-to-face conversations. Also, a methodological aspect of this study that warrants further consideration is its combination of a sorting task and written problem labels. Though this approach was an efficient means for empirically developing a problem-classification structure and helped limit researcher intrusion into the measurement process, it would be useful to consider alternatives.

Broadly, the problem structure emerging from this study provides a more solid basis than has heretofore existed for integrating empirical results about the processes of categorization and formulation of particular problem categories. This study provides no data for this purpose, but such data should not remain beyond the scope of future research. It is likely that the nature of information-processing models of problem recognition (Cowan, 1986) and the political and social aspects underlying models of problem

formulation (Lyles, 1981) vary depending on the category of problem addressed. Research efforts geared to addressing those relations can shed more light on the ways in which schema-relevant (or irrelevant) and schema-consistent (or inconsistent) information can enhance or detract from the interpretation of organizational problems. Understanding the dynamics underlying the process of categorization itself—for example, learning whether categorization involves the surface structure of the literal words evoked or the deeper structure of principles governing relationships (Chi, Feltovich, & Glaser, 1981)—would seem to hold answers to some of these questions.

Finally, the consequences of evoking particular categories of organizational problems are in need of deeper understanding. It is not enough to state that problem concepts and their labels constrain interpretation (e.g., Schwenk & Thomas, 1983) or that when communicated they influence the interpretations and behaviors of others (Donnellon, 1986). Exactly how different problem categories are linked to these processes is almost entirely unknown, even though organizational problems remain a major agenda item for most executives. The need is clear, and gaining integrated knowledge of this sort offers great potential benefits.

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APPENDIX
Problems Employed in the Sorting Task[a]

1. Uncertainty in determining a company's future staffing needs*
2. "Responsibility" conflicts created by reorganizing staff positions*
3. Difficulty allocating a workforce to different tasks, when understaffed*
4. Difficulty trying to match a company's products with long-term market needs (L)
5. Inability to determine budget costs for a major project*
6. Person assigned to an inappropriate job (poor job match)
7. Difficulty balancing projected staffing needs with budget constraints*
8. Increase in the number of customer complaints (L)*

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[a] Phase one of the data collection for this study generated 57 of these problems; 12 were adapted from Nutt (1984, indicated with "N"); and 9 were adapted from Lyles and Mitroff (1980, indicated with "L"). The 45 problems followed by an asterisk loaded most heavily on each end of the six dimensions interpreted in this study.

9. Customer misuse of a new product (L)*
10. Routine audit reveals charges not billed; indicates inaccurate records (N)*
11. Negative cash flow experienced during construction project (N)*
12. Market share eroding because of increasing competition (N)*
13. Adverse economic ramifications from closing a plant*
14. Imbalance of raw materials in manufacturing (L)*
15. Adverse effect on sales from changing social & political attitudes (L)*
16. Deterioration of referral base caused by changing the company location (N)
17. Stockouts occurring too frequently (N)*
18. Useful in-house service is lost because of someone's resignation (N)
19. General management ineffectiveness
20. Difficulty allocating scarce resources
21. Difficulty maintaining business hours during a major construction project*
22. Failing to create cooperative relationship between labor and management
23. Difficulty encountered by changing the basic mission of the organization*
24. Difficulty changing the company's client mix to increase independence
25. Inability to formulate a strategy to rectify company "weaknesses"*
26. Difficulty determining structural changes to meet a changing environment*
27. Difficulty developing working relations with a potential partner firm
28. Raw material resources becoming increasingly scarce*
29. Difficulty trying to balance pricing and service level with related costs*
30. Difficulty choosing outside agencies to help design a new program
31. Not meeting a shipping quota for a particular product*
32. High frequency of absenteeism and tardiness*
33. Deciding who to assign to an undesirable and difficult task
34. "Scheduling" conflicts
35. Lack of communication about a companywide change in operations
36. An important machine continually malfunctions*
37. Difficulty implementing new technology (L)
38. Continually not getting reports finished on time
39. Not keeping production within quality control limits*
40. Inability to develop a workable procedure for a new operation
41. Having to phase out jobs because of budget cutbacks
42. Unable to keep up with the mechanics of data gathering for control*
43. Poor working relations based on personality style conflicts*
44. Inadequate training for newly assigned responsibilities
45. Female employee being discriminated against for promotion
46. Poor performance feedback; too many employees being overrated
47. Declining workgroup morale*
48. Noticeable disinterest in employee involvement (taking commitment for granted)
49. Not putting forth effort (just getting by)*
50. Difficulty communicating with others
51. Difficulty compensating employees effectively
52. Worker bothering coworkers because of a belligerent attitude*
53. Resistance to changes being made regarding working hours
54. A manager's inability to get subordinates to do well
55. Delays resulting from the introduction of new manufacturing technology
56. Difficulty designing and developing a competitive product*
57. Technical differences between departments that need to interact frequently
58. Outdated machinery*
59. Inability to obtain adequate information about customer satisfaction*
60. Confusion over the services expected from the data processing department*
61. Difficulty fulfilling the potential uses of a newly acquired computer (L)*
62. Insufficient reporting procedures for a new project*
63. Difficulty improving the quality of a product

64. Developing an effective network for intra-organizational computer usage*
65. Difficulty encountered when changing accounting methods*
66. Difficulty determining how to comply with new tax legislation (L)*
67. Company image in the marketplace is poor and declining (N)*
68. Complaints of lack of privacy caused by combining workstations (N)
69. Suspicion of theft within the company
70. Complaints of pay dissatisfaction among employees*
71. Complaints arising due to inadequate parking space (N)
72. Difficulty developing a professional atmosphere to support corporate mission*
73. Noticeable space shortages within the company
74. Grievances filed over excessive workload (N)*
75. Expected legislation against particular company activities (L)*
76. Recession likely to decrease customer spending*
77. Violation issued because of delinquency in completing records (N)
78. Difficulty gathering accurate information for data base/record keeping (N)*

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EFFECTS OF EMPLOYMENT GAPS ON THE CAREERS OF M.B.A.'s: MORE DAMAGING FOR MEN THAN FOR WOMEN?

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This study investigated the impact of employment gaps on two dimensions of managerial careers: income and satisfaction. As was hypothesized, the results from a survey of M.B.A. degree holders revealed that discontinuous employment histories were negatively associated with future income and satisfaction. The impact of a gap was found to be more severe for men than women. The findings suggest discrimination against men not following a traditional career path.

This study examined the impact of employment gaps on managerial careers and determined if gender moderated that impact. The effect of employment gaps on the career paths of managers is of interest from two points of view. First, involuntary managerial turnover has increased dramatically in recent years because of the high incidence of company restructuring resulting from mergers and acquisitions, strong foreign competition, rapid technological change, and shifts in economic activity. In the 1980s, more than two million managers have lost their jobs because of restructuring (Deutsch, 1988). Traditionally, managers thought of a career as uninterrupted movement up the corporate ladder. It is now apparent that a managerial career may also include an involuntary gap in employment (Budge & Janoff, 1984; Hirsch, 1987). It is therefore important to confirm that a large percentage of managers are experiencing employment gaps and to examine the effects of such gaps on careers. In addition, employment gaps are of interest from the viewpoint of their impact on women's careers. A popular perception is that women interrupt their careers more frequently than men as a result of childbearing (Taylor, 1986). Such interruption is often given as one of the reasons why women have not been able to move into senior management positions in corporations. Given this perception, it is important

to confirm that women do interrupt their careers more frequently than men and to ascertain if such gaps in employment affect women in the same ways they affect men. This study's unique contribution is its focus on two aspects of careers—income and satisfaction—and the moderating role of gender.

Employment Gaps

In this article, an employment gap specifically refers to a period without employment that occurred in the career history of a currently employed person. It does not include a paid or unpaid leave from work. For a period to be considered a gap, it must have involved total severance from any company. An employment gap can be the result of either voluntary or involuntary turnover. When turnover is voluntary, employees are responsible for initiating the separation from an organization. Leaving the work force for a time to go to school or raise children would produce voluntary gaps. Involuntary turnover, in which employers initiate the separation, can be either personal or nonpersonal (Schneer, 1988). Personal reasons for involuntary turnover include performance, ability, effort, honesty, and personality problems. Nonpersonal reasons include technological change, downsizing, plant relocation, and company takeovers.

PAST RESEARCH

Employment Gaps and Income

One of the primary focuses of this research was the impact of employment gaps on income. Theoretically, we would expect income to be positively related to work experience because of the accumulation of human capital that experience allows. Human capital, which is defined as the skills and knowledge that make an employee productive and valuable, can be acquired through work experience, during which people make contacts, learn new skills, and gather information that promote future earnings potential (Bergmann, 1986). A career interruption diminishes total work experience. Therefore, people with gaps will have accumulated less human capital and may be paid less when reemployed than comparable continuously employed people.

A number of studies have empirically demonstrated a negative relationship between employment gaps and income. In her study of 1974 Stanford M.B.A.'s, Strober (1982) compared the 1978 incomes of those working fulltime who had continuous employment histories and those with employment gaps. Among her respondents, 26 percent of the women (N = 7) and 7 percent of the men (N = 10) had had employment gaps since receiving their M.B.A.'s. Holding two other income determinants constant (employer's industry classification and a travel requirement on the job), Strober found that individuals with gaps earned about $9,000 (28%) less than continuously employed individuals. Devanna (1984) also compared the incomes of M.B.A.'s with and without career interruptions. In her matched pairs of 45

men and 45 women who graduated between 1969 and 1972, only 8 people reported gaps, all of them women. The income of those with gaps was about $1,700 (4%) less than the income of the other women, and $6,000 (14%) less than the income of the entire cohort.

It appears that employment gaps are negatively associated with income. What is unclear is whether employment gaps have a negative effect on income beyond that which can be attributed directly to diminished work experience. In theory, human capital depreciates during a period of unemployment as skills and knowledge deteriorate with disuse (Bergmann, 1986; Blau & Ferber, 1986). Therefore, an employment gap should have a negative effect on income beyond that directly attributable to diminished work experience. Additional theoretical support derives from the sociological literature on work and career paths (Anderson, 1964). Our culture places great importance on work for pay. "When we meet a person who does not work . . . [we think] something must be 'wrong' " (Anderson & Carter, 1984: 197). Thus, the stereotype of a good manager encompasses uninterrupted movement up the corporate ladder (Hall, 1987). Widespread acceptance of this traditional managerial career path leads to suspicion of people with discontinuous work histories. Even if a gap was due to major organizational restructuring, other employers, and even the affected employee, often feel that the restructured company would have found a way to keep good managers (Deutsch, 1988). Therefore, people doing corporate hiring may be prejudiced against managers with histories of career interruptions.

A few studies have investigated whether employment gaps affect managerial income beyond their impact on total work experience. Two of the studies surveyed M.B.A.'s and made income comparisons using regression analysis contrasting full-time workers with continuous employment histories and those with gaps in employment. Reitman (1985) analyzed the incomes received in 1984 by Pace University M.B.A.'s who graduated between 1976 and 1980. Of those employed full time, 32 percent ($N = 31$) of the women and 11 percent ($N = 12$) of the men had experienced gaps since receiving their degrees. She found that with three factors held constant— pre- and post-M.B.A. work experience, hours worked, and holding a job in finance—each six-month interruption reduced income about $3,000. After differences in total years of work experience had been accounted for, respondents with career interruptions earned 12 percent less than those continuously employed. Similarly, Olson and Frieze (1987b) analyzed incomes received in 1983 by University of Pittsburgh M.B.A.'s who graduated between 1973 and 1982. Of those employed full-time, 26 percent of the women ($N = 86$) and 19 percent of the men ($N = 151$) had had gaps in their careers since receiving their degrees. With pre- and post-M.B.A. work experience and gender held constant, having a one-year gap reduced income by about $6,000. This amount corresponded to 15 percent less income than the continuously employed respondents received, with differences in total years of work experience controlled.

These studies suggest that career interruptions do have a negative effect on the income of managers beyond that attributable to the reduction in work experience. Thus,

> Hypothesis 1: *Managers with a gap in their employment history will earn less income than continuously employed managers, even with experience controlled.*

Very little information is available on whether the negative impact of employment gaps on income is the same for men and women. Human capital theory suggests that the impact of employment gaps on income might not be the same for the two because of gender differences in investment in specific human capital—knowledge and skills that are particular to a job and not transferable. Workers who have invested more in specific human capital suffer greater wage loss from displacement than workers who have invested less, because a build-up of specific human capital is associated with salary increases in the job in which it occurs but will not contribute to salary on a new job. "Women workers are expected to invest less in job-specific human capital than otherwise comparable men workers because women expect to spend less time [in the labor force]" (Madden, 1987: 246). Thus, women managers would incur less wage loss as a result of employment gaps than men.

Additional theoretical support for the notion that gender moderates the relationship between gaps and income comes from application of the literature on gender role socialization to the present topic. According to that literature, career path stereotypes differ for men and women (Russo, 1985). The stereotype of the traditional manager with a continuous work history appears to apply more to men: "Beliefs about differences between the sexes . . . take as axiomatic that women's primary sphere is the home—and that of men is the workplace" (Reskin & Hartmann, 1986: 125). Traditionally, women are expected to leave the work force to have and raise families. Women thus possess a socially acceptable reason for being out of the work force that does not relate to competence, but men do not. This difference could lead to less prejudice against women with discontinuous employment histories. The impact of an employment gap on future income would thus be less severe for women than for men.

An alternate view of gender differences, based on the concept of discrimination in the workplace, suggests the reverse scenario—that the effect of employment gaps on managerial income will be worse for women than for men. Research has generally found that women earn less than comparable men (e.g., Bergmann, 1986). If this income difference is due to discrimination, women may also experience such discrimination when seeking new jobs and will have fewer and less favorable opportunities for reemployment than men with equivalent work histories. Thus, the impact of employment gaps on income would be more severe for women than for men.

Very little empirical research has been conducted to examine gender differences in the income effect of career interruptions. What has been done

has suggested that differences exist but has not established a direction or offered an explanation. Olson and Frieze's (1987b) examination of the reasons for career interruptions lent support to the socialization perspective: interruptions for family reasons (reported almost entirely by women) were not associated with lower income, but gaps experienced for reasons that reflected difficulty in finding a job (reported primarily by men) were significantly associated with lower income. However, Olson and Frieze's results were only suggestive, as those researchers did not directly test for gender differences in the impact of gaps on income.

Two studies in the economic literature have also examined this question, analyzing data from national labor surveys to determine the effects on income of nonpersonal involuntary turnover in the general work force. After controlling for age, education, industry, occupation, and location, Madden found that "displaced women lose about 11 percent more salary growth than men" (1987: 250). Regression analyses revealed that the salaries of men with employment gaps grew 16 percent less than those of continuously employed men, even with tenure controlled. For women, this loss in salary growth as a result of employment gaps was 27 percent. Maxwell and D'Amico (1986) found that men had higher rates of job loss but were reemployed more quickly than women. If women did work again, their wage loss was somewhat greater than that of men, "controlling for human capital (tenure, education, age, and race) and institutional (changing industry, occupation, and residence) differences" (Maxwell & D'Amico, 1986: 376). These economic studies support the concept of gender discrimination as they have shown that the impact of employment gaps was worse for women than men.

Theory and past research suggest that gender will moderate the impact of gaps on income, although the direction of the gender differences is unclear. Thus,

> Hypothesis 2: Gender will moderate the effect of employment gaps on income.

Employment Gaps and Career Satisfaction

The second focus of this study was the impact of employment gaps on career satisfaction. Theoretically, we would expect career satisfaction to be negatively related to employment gaps. If employment gaps have a negative effect on income, managers with employment gaps may well be less satisfied with their careers than continuously employed managers. Strober (1982) and Reitman (1985) demonstrated a positive relationship between satisfaction and income in their studies of M.B.A.'s. Research on career path stereotypes suggests that employment gaps should have a negative effect on satisfaction beyond that due to diminished income because of disconfirmed expectations about traditional career paths (Anderson, 1964). Employers expect good managers to have uninterrupted career paths, and managers have been socialized to expect the same. When their careers include gaps, they will experience diminished satisfaction with their careers. It would be important

to verify that employment gaps negatively affect satisfaction and to learn whether diminished income is solely responsible.

No research has investigated the impact of employment gaps on career satisfaction, although some research has examined related variables. Leana and Ivancevich (1987) and Schneer (1988) recently reviewed the literature on the psychological effects of involuntary turnover. Although it would seem that the impact on career satisfaction would be part of those effects, none of the studies has examined it. The psychological responses studied have included self-esteem, well-being, and outlook on life, and examination of the results of this research suggests that career interruptions might have a negative impact on career satisfaction. For example, Hepworth (1980) found that unemployed respondents exhibited less satisfaction with life than an employed comparison group. And a longitudinal study (Hyman, 1979) using data from a national survey lent credence to the idea of a lasting impact on satisfaction even after reemployment.

There is no direct empirical evidence on the effect of employment gaps on career satisfaction, although theory on career path stereotypes suggests a negative impact. Thus,

> Hypothesis 3: Managers with a gap in their employment history will have lower levels of career satisfaction than continuously employed managers, even with income controlled.

There is very little information available on whether this impact of gaps on satisfaction is the same for men and women. Theoretically, the impact of a gap on satisfaction should be more severe for men than women. Since men have been socialized to expect continuous careers, when careers do not follow the traditional pattern, they will have diminished satisfaction (Anderson, 1964). Women, on the other hand, expect to have gaps in employment, and therefore such gaps might not affect their career satisfaction (Russo, 1985). As no empirical study has addressed this question, the direction of the gender difference is unclear. Thus,

> Hypothesis 4: Gender will moderate the effect of employment gaps on career satisfaction.

To summarize, the purpose of this study was to examine the effect of employment gaps on two dimensions of managerial careers, income and satisfaction, and to determine if gender moderated those effects. This study expanded on prior work investigating the impact of employment gaps on the income of managers by examining the issues of gender differences. In addition, this study focused on an important career factor that prior studies of employment gaps have not addressed—career satisfaction.

METHODS

Respondents

To test the four hypotheses, in 1987 we sent surveys to 1,361 individuals holding M.B.A. degrees who appeared in the alumni lists of two large north-

eastern universities (49 undeliverable surveys are not included in this fig-
ure). The people surveyed had received their degrees between 1975 and
1980, dates chosen to maximize the number of years of post-M.B.A. work
experience and to ensure representation of both men and women. In order to
generate a large enough sample of women with career interruptions, we
solicited responses from all women in each graduating year and from a
random sample of the same number of men from each year. We mailed a
six-page survey to each person and sent three follow-up letters, after a week,
three weeks, and seven weeks. A total of 925 questionnaires were returned,
yielding a 68 percent response rate. Alumni office records on year of grad-
uation were not always accurate, so we had to exclude 41 respondents from
the study because they reported graduating after 1980. The returns were
equivalent for the two universities. The respondents were about evenly di-
vided between men (N = 462) and women (N = 422). Their average age was
38 years, with two-thirds between the ages of 31 and 40. Almost three-
quarters were married, and 64 percent had children. In terms of employment
status, 88 percent of the respondents were currently employed full-time, 5
percent were employed part-time, and 7 percent were not currently em-
ployed. Employment status statistics were significantly different for men
and women (χ^2 = 97, p < .001). For the men, 98 percent were employed
full-time and 2 percent were not employed. For the women, 77 percent were
employed full-time, 9 percent were employed part-time, and 14 percent
were not employed. As expected, many respondents (30%) had experienced
periods when they were not employed.

Measures

   The survey included questions on present income (yearly salary plus
bonus), field of responsibility, hours worked per week, present employment
status, career satisfaction, pre- and post-M.B.A. work experience, and post-
M.B.A. employment gaps. We gathered information about career interrup-
tions by asking respondents if there had been periods during which they
were not employed since receiving their M.B.A. degree. If they reported an
employment gap, respondents were then asked to indicate the number of
gaps, their length, whether they were voluntary, and the reason or reasons
for the gaps. Career satisfaction was computed as average satisfaction with
eight career criteria—salary, title, autonomy, responsibility, job security,
skill enhancement, skill use, and opportunity for advancement. The scale
demonstrated strong internal consistency reliability (α = .87).

Data Analyses

   The group analyzed (N = 713) was composed of the respondents who
reported in the survey that they were working full-time and had had either
no or one post-M.B.A. career interruption. We excluded respondents who
reported no current work or reported part-time work since the focus of this
study was on the effects of an employment gap on current income and
satisfaction. As research on career development (Chorba & York, 1986) and

preliminary data analyses suggested that the career implications of multiple gaps may be qualitatively different than those of single gaps, the small percentage that had more than one gap (6 percent of both the men and the women) were also not included in the analyses. This procedure provided for a strong, unambiguous test of the effect of a single employment gap on income and career satisfaction.

Multiple regression analysis was conducted to examine the effect of a gap on income. The presence of an employment gap was entered as a dummy variable. We controlled work experience by including a measure of years of post-M.B.A. work experience in the equation. Pre-M.B.A. work experience was included in initial models but was dropped because it did not contribute significantly. We controlled three other variables that we found to influence income by including them in the model: the reported number of hours worked per week, gender (entered as a dummy variable), and field of responsibility (six fields, coded as five dummy variables representing accounting, management, computer science-engineering, finance, and marketing). Prior studies have found these independent variables to be important contributors (Olson & Frieze, 1987a; Madden, 1987; Reitman, 1985). The gap-by-gender interaction term was added to the model to determine if gender moderated the impact of a gap on income. Where the interaction was significant, we estimated separate equations for men and women. This procedure provided for the appropriate estimate of the effect of a gap on income because the magnitude of the effect varies across gender.

The statistical analyses for the career satisfaction hypotheses paralleled the income analyses. To determine if managers with a gap had lower satisfaction than those continuously employed, we used multiple regression, again entering the presence of an employment gap as a dummy variable. Income was controlled by inclusion in the regression model. Two other variables found to determine career satisfaction were also controlled via inclusion in the model: gender and field of responsibility. To determine if gender moderated the impact of a gap on career satisfaction, we added the gap-by-gender interaction term to the model and estimated separate equations for men and women where the interaction was significant.

RESULTS

Table 1 shows the correlation matrix and descriptive statistics for the independent and dependent variables. Significantly more of the women than the men had experienced an employment gap (24% vs. 12%, $\chi^2 = 19$, $p < .001$). Characteristics of the employment gaps studied appear in Table 2. The gaps were fairly short for both the men and the women, with 87 percent of the career interruptions lasting one year or less. The women's gaps were significantly more likely to be voluntary, and the reverse held for men ($\chi^2 = 10$, $p < .01$). The reasons reported for the gaps also differed by gender ($\chi^2 = 35$, $p < .001$). As we expected on the basis of present trends, a large percentage of both men and women specified company restructuring as the

TABLE 1
Pearson Correlations and Descriptive Statistics[a]

Variables	Means	s.d.	1	2	3	4	5
1. Work experience	8.39	1.76					
2. Hours	49.14	8.94	.11				
3. Gap[b]	0.17	0.37	−.12	−.09			
4. Gender[c]	0.42	0.49	−.16	−.09	.16		
5. Income[d]	64.63	26.50	.16	.44	−.21	−.21	
6. Satisfaction[e]	3.66	0.73	.03	.22	−.12	.03	.35

[a] $N = 713$. Correlation coefficients greater than .09 are significant at $p < .01$.
[b] This variable was dummy-coded, with 1 = gap, 0 = no gap.
[c] This variable was dummy-coded, with 1 = woman, 0 = man.
[d] Income was measured as yearly salary plus bonus in thousands of dollars.
[e] Satisfaction was measured on a 5-point scale, with high scores indicating greater satisfaction.

TABLE 2
Characteristics of Employment Gaps Studied[a]

Characteristics	Total	Men	Women
Length of gap[b]			
Mean	8.5	7.4	9.2
Median	6.0	5.0	6.5
Type of gap			
Voluntary	49	31	61**
Involuntary	51	69	39
Reasons for gap[c]			
Firm restructuring	35	45	29***
Child-rearing	20	0	33
Personality mismatch	15	30	4
Relocation	9	2	14
Career change or school	9	6	10
Job dissatisfaction	6	9	4
Health problems	4	2	6
Performance	1	0	1
Other	6	9	4

[a] There were 119 respondents, 48 men and 71 women. All statistics except those for length of gap are percentages.
[b] Length is reported in months.
[c] Respondents could indicate more than one reason.
** $p < .01$ for χ^2
*** $p < .001$ for χ^2

reason for a gap. Although this reason was the one the men cited most frequently, the women most frequently cited child-rearing.

Before testing the hypotheses, we conducted demographic analysis to check for comparability between respondents with and without employment gaps. Results indicated no significant differences in age, year of graduation, M.B.A. major, school, field of job responsibility, pre-M.B.A. work experi-

ence, or socioeconomic background as measured by the education of father and mother. The validity of the self-report measure of employment gaps was supported by the finding that, compared to continuously employed M.B.A.'s, those with a gap had significantly shorter lengths of tenure on their present job and in their present company, fewer years of full-time post-M.B.A. work experience, and more post-M.B.A. employers.

Table 3 gives simple means and standard deviations for the income and career satisfaction of M.B.A.'s employed full-time with and without employment gaps. Respondents with a gap earned approximately $15,000 (22%) less than those who had been continuously employed. Examining the means for men and women shows that for both genders a gap was associated with lower income; however, the magnitude of the difference was greater for men ($17,774) than for women ($9,094). These figures represent 25 percent less income for the men with an employment gap as compared to continuously employed men and 15 percent less income for the women with a gap as compared to continuously employed women. People with a gap were also less satisfied with their careers than the continuously employed, but examining the means for men and women shows that this lower satisfaction only applied to the men: continuously employed men and all women had almost identical mean satisfaction scores, and only men with a gap exhibited lower satisfaction levels.

Income Analyses

The findings from the multiple regression analysis support Hypothesis 1. Model 1 of Table 4 shows statistics from this analysis. The coefficients of the independent variables can be interpreted as follows: all other things being equal, (1) each year of post-M.B.A. work experience added $1,100 to income, (2) each additional hour worked per week added $1,100 to income, (3) working in management increased income by $7,700, and (4) being a woman reduced income by $7,500. After work experience, hours of work, field of responsibility, and gender had been accounted for, having an employment gap reduced income by an additional $9,600, or 14 percent. The

TABLE 3
Mean Incomes and Career Satisfaction of Respondents[a]

Variables	Total		Men		Women	
	No Gap	Gap	No Gap	Gap	No Gap	Gap
Income	67.11	52.16	71.32	53.54	60.27	51.18
	(26.31)	(23.88)	(26.93)	(20.10)	(23.80)	(26.32)
Career satisfaction	3.70	3.46	3.72	3.10	3.69	3.71
	(0.70)	(0.83)	(0.71)	(0.86)	(0.69)	(0.72)

[a] The numbers in parentheses are standard deviations. There were 119 respondents with gaps, 48 men and 71 women. There were 594 respondents without gaps, 368 men and 226 women.

TABLE 4
Results of Regression Analyses of Income[a]

Variables	Model 1	Model 2	Model 3a[c]	Model 3b[c]
Experience	1.1*	1.1*	1.0	1.3
Hours	1.1***	1.1***	1.3***	1.0***
Field[b]				
Accounting	−2.4	−2.4	−4.1	−0.6
Management	7.7*	7.5*	5.8	9.2*
Computers	−4.9	−5.0	−9.8*	5.0
Finance	5.2	5.4†	2.8	8.5†
Marketing	4.9	5.0	2.6	7.9†
Gender	−7.5***	−9.1***		
Gap	−9.6***	−14.7***	−14.8***	−5.6†
Gap × gender		9.3*		
R^2	.27	.28	.26	.24
F	28.8***	26.4***	17.7***	10.8***
df	9,688	10,687	8,399	8,281

  [a] The reported statistics are unstandardized regression coefficients.
  [b] This variable was dummy-coded, with 1 = work in the field specified, 0 = not in this field.
  [c] Model 3a used data on men; model 3b used data on women.
    † $p < .10$
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

multiple regression model accounted for 27 percent of the variance in income. Results of logarithmic salary models were similar.

The gap-by-gender interaction term was added to the model (see model 2) to test Hypothesis 2. The interaction term made a unique contribution to the income regression analysis ($F = 3.9$, $p < .05$), so we estimated separate equations for men and women (see models 3a and 3b). The presence of a gap significantly contributed to the income regression for men ($F = 16.6$, $p < .001$) but was marginal for women ($F = 3.3$, $p < .07$). An employment gap was associated with \$14,800 (21%) less income for men and only \$5,600 (9%) less income for women. These findings support Hypothesis 2 as they suggest that the presence of a gap is more damaging to the income of men than to that of women.

Career Satisfaction Analyses

The findings from multiple regression analysis also support Hypothesis 3. The statistics from this analysis appear in model 1 of Table 5. The regression coefficients indicate a statistically significant relationship between satisfaction and the independent variables of income, a job in accounting, gender, and gap. The presence of a gap significantly contributed to the regression analysis for satisfaction ($F = 4.7$, $p < .05$). After controlling for income, field of responsibility, and gender, we found that M.B.A.'s with a gap had lower satisfaction levels than those who had been continuously employed. The model accounted for 15 percent of the variance in satisfaction.

TABLE 5
Results of Regression Analyses of Career Satisfaction[a]

Variables	Model 1	Model 2	Model 3a[b]	Model 3b[b]
Income	.01***	.01***	.01***	.01***
Field				
Accounting	.19*	.19*	.12	.26*
Management	.17†	.16†	.11	.21*
Computers	−.14	−.15	−.25†	.02
Finance	.02	.03	.00	.06
Marketing	.03	.04	.01	.08
Gender	.15**	.06		
Gap	−.15*	−.46***	−.46***	.08
Gap × gender		.54***		
R^2	.15	.17	.21	.12
F	15.8***	16.0***	15.1***	5.3***
df	8,690	9,689	7,401	7,282

  [a] The reported statistics are unstandardized regression coefficients.
  [b] Model 3a used data on men; model 3b, data on women.
    † $p < .10$
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

The gap-by-gender interaction term was added to the model (see model 2) to test Hypothesis 4. The interaction term made a unique contribution to the income regression ($F = 15.1$, $p < .001$), so we estimated separate equations for men and women (see models 3a and 3b). The presence of a gap significantly contributed to the satisfaction regression only for men ($F = 18.1$, $p < .001$). These findings lend support to Hypothesis 4 as they suggest that the presence of a gap is associated with lower satisfaction levels for men but not for women.

DISCUSSION

This study confirms that a large number of people with M.B.A.'s have experienced career interruptions. The data suggest that employment gaps have a negative impact on future income beyond that attributable to diminished work experience. M.B.A.'s with employment gaps earned 14 percent less than those who had been continuously employed after other income determinants had been controlled. This finding is consistent with the research of Olson and Frieze (1987b) and of Reitman (1985), in which the income effects were 15 and 12 percent, respectively. This result can be explained from a sociological perspective; stereotypes of the good manager with a traditional, uninterrupted career path lead to prejudices against people with discontinuous employment histories (Anderson, 1964; Hall, 1987). An alternate explanation based on an economic perspective suggests that human capital depreciates during a period of unemployment as skills and knowledge deteriorate with disuse (Bergmann 1986; Blau & Ferber, 1986).

This study also confirms that women with M.B.A.'s are more likely to experience gaps than men with M.B.A.'s but suggests that the impact of a gap on income is less severe for women than for men. Compared to the incomes of those without gaps, the incomes of men with an interruption were 21 percent lower, and women's were 9 percent lower. This finding is inconsistent with the results of Madden (1987) and Maxwell and D'Amico (1986), which revealed the impact of a nonpersonal, involuntary gap to be worse for women than for men. But even when we restricted our analyses to people with gaps caused by restructuring to make our data more comparable with the prior studies' data, our findings did not change.

A number of differences between the present study and the studies of Madden (1987) and Maxwell and D'Amico (1986) suggest that the results are really not inconsistent but rather, not comparable. Their studies examined a different population than the present study, including all levels of workers, with managers composing only a small percentage. This difference suggests that their results are not applicable to managerial men and women. As members of the general labor force, the men and women in the earlier studies were also not comparable to each other on many dimensions, such as occupation and education, and the controls may not have been sufficient to account for those differences. In addition, many of the women in the studies had opted not to return to the work force. Finally, in one of the studies (Maxwell & D'Amico, 1986), the gender differences were significant only at the .10 level.

Suggestive of our results are Olson and Frieze's (1987b) findings that when family reasons caused interruptions, little impact on income not accounted for by the lost years of full-time work experience occurred. Given Olson and Frieze's results and our finding that men's gaps were primarily involuntary and women's voluntary, we thought that whether or not a gap was voluntary might be an alternate explanation for the gender difference. If employers tend to view involuntary gaps as more suspect than voluntary ones, they may award lower salaries and positions to people with histories of involuntary gaps. However, we found that differences in volition could not account for the gender differences in the effect of a gap on income.

This moderating effect of gender may be the result of gender-specific career-path stereotypes that lead to discrimination against men who do not follow a traditional career path. An alternate explanation suggests that women invest less than men in specific capital and therefore suffer less wage loss from displacement. However, we controlled several aspects of investment in human capital in this study, including education, field of job responsibility, and hours worked per week; thus, human capital theory may not adequately explain our findings.

The results of the study suggest that career interruptions diminish career satisfaction beyond the decrease attributable to lower income for men but not for women. This moderating effect of gender may again be the result of gender-specific career-path stereotypes that affect society's perceptions and the personal expectations of men and women with M.B.A.'s (Russo,

1985). Women are often expected to interrupt their careers at some time to attend to family needs, so having an employment gap does not alter their satisfaction with their career paths. On the other hand, the traditional career path for men does not allow for employment gaps. Therefore, when men experience gaps, disconfirmed expectations lead to diminished career satisfaction. Whether or not a gap was voluntary did not account for this gender difference in the impact of a gap on satisfaction.

Limitations

A number of limitations of the study must be noted. The regression analyses explained a maximum of 28 percent of the variation in income and 21 percent of the variation in career satisfaction. Other factors that we were not able to measure explained additional variation. In addition, this study was cross-sectional, comparing M.B.A. degree holders with an employment gap to those who had been continuously employed. Therefore, a causal interpretation must be guarded. As we had no information about the respondents that predated the employment gaps, we cannot be certain that income growth and satisfaction were actually decreased by the gaps. The reverse causal relationship is possible: people with low income and satisfaction levels may be more likely to experience employment gaps. Longitudinal research is needed to corroborate the findings from this study.

Two restrictions in focus should be noted. We only examined single gaps and do not know if the career implications of multiple gaps would be the same. Also, this study focused on gaps in which ties to a firm were totally severed. As many women do not resign from their jobs when they have children but take temporary leaves, it is important to determine the career implications of such leaves. Both of these topics are interesting areas for further research.

Implications

This study has a number of significant societal implications. The findings suggest that men with nontraditional career paths may be facing discrimination in the workplace. Stereotypically, there is no socially acceptable reason for a man to interrupt his career, except perhaps for health problems or additional schooling. However, society expects women to have discontinuous career paths because they fulfill nurturing or domestic roles. With these stereotypes in mind, employers may be offering considerably lower salaries and positions to men with gaps, and such men are experiencing diminished career satisfaction.

Women may or may not find our results comforting, depending upon their interpretation. The findings do dispute the discrimination perspective according to which women with employment gaps will have fewer and less favorable opportunities for reemployment than men with equivalent work histories. However, the women in this study did earn less than the men. Perhaps discrimination is a factor but operates differently than prior research has suggested. Women may be paid less because they are expected to
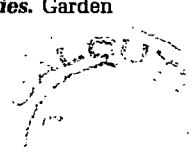
be less committed for the long term. If they do interrupt their careers, the penalty may be lower because their prior salaries already reflected the possibility of a future gap. Thus, having an employment gap appears to render a man comparable to a woman in terms of income. For continuously employed M.B.A.'s, men earned significantly more than women. However, after an employment gap had occurred, men's and women's incomes were almost identical. Clearly, it is important to realize that the greatest discrimination reflected in this study is against women holding M.B.A. degrees who do not have gaps in their employment histories. These women received significantly lower incomes than comparable men. In fact, women needed six more years of work experience to receive the same income.

On a different level, the lowered satisfaction shown by men with a gap implies that organizational restructuring has a societal cost. The cost-benefit analyses of mergers and acquisitions may not adequately account for this negative factor.

CONCLUSIONS

The results of this study suggest that an employment gap has a significant negative effect on the careers of people with M.B.A. degrees. Such gaps have become part of the work pattern for perhaps as many as 30 percent of the managerial work force. Even relatively brief career interruptions can have a large effect. It appears, therefore, that further longitudinal study on the effects of such gaps is needed, as well as investigation of programs that employers and governments can implement to ease the consequences. For women, this study suggests that the effects of a career interruption are not as devastating as many fear. The gaps are more damaging to the future income and career satisfaction of men. Since the incidence of employment gaps for managers is increasing with organizational restructuring, the stigma of losing a job may be declining and eroding the stereotype of the good manager with a traditional, uninterrupted career path. If employment gaps continue to be part of the managerial career experiences, attitudes toward gaps are likely to change, and both men and women are likely to benefit.

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AGE AND WORK PERFORMANCE IN NONMANAGERIAL JOBS: THE EFFECTS OF EXPERIENCE AND OCCUPATIONAL TYPE

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This study examined the relative explanatory powers of age and total years of experience in an occupation for predicting supervisory ratings of work performance. As predicted, results indicated that experience was a better predictor of performance than age. A breakdown of jobs into five occupational groupings revealed a moderating effect for occupational type. Findings also showed that age and experience exhibit nonlinear relationships with performance.

There is a growing awareness that issues regarding the aging of employees will take on increasing importance for human resources management in upcoming years (McLaughlin, 1989; Rosen, 1988). The percentage of older employees in the total United States' work force will continue to grow as the baby boom generation ages. At the same time, fewer younger workers will be available because of the decline in the number of children born during the 1970s and 1980s referred to as the "baby bust" (McLaughlin, 1989). Signaling those trends, in 1975 the average age of the members of the U.S. work force was 28 years; by the early 1990s, the average age will jump to 40 years (Rosen, 1988).

Many employers expect that a shift in the age composition of the work force will exacerbate promotional bottlenecks at the upper levels of organizations and labor shortages at the entry level. In response to these concerns, many organizations have begun to confront the problem of promotional bottlenecks by introducing lucrative "buy-out" packages to encourage older employees to retire early (Howard, 1988).

Other factors promoting the increasing awareness of issues involving older workers include recent concerns over the financial stability of the "Social Security" system; enactment of the Age Discrimination in Employment Act of 1967, amended in 1978; problems of worker obsolescence; explosive growth in the number of age discrimination cases filed over the last ten years (Rosen, 1988; Sparrow & Davies, 1988); and the 1986 removal of mandatory retirement for most occupations. Such legislation exempts a few

occupations whose incumbents affect public safety, such as airline pilots. The removal of mandatory retirement by the 1978 and 1986 amendments to the Age Discrimination in Employment Act has placed the decision to stop working largely in the hands of older employees themselves. However, there is growing concern that organizations will employ strategies to pressure out older employees who refuse to leave their jobs (Howard, 1988; Sparrow & Davies, 1988). Collectively, these factors highlight the importance of gathering data that might improve understanding of how aging processes affect work performance.

A more systematic examination of differences in work performance at different ages and across different occupations could help firms make effective decisions about older employees. The purpose of the current investigation was to address some key questions previous research has not addressed regarding the relationship of age and work performance.

A THEORY OF AGE AND WORK PERFORMANCE

A theoretical understanding of age and work performance must begin with a broader framework of the general determinants of an individual's work performance. Blumberg and Pringle (1982) and Waldman and Spangler (1989) emphasized a model of work performance in which performance is the product of ability, motivation, and context (or opportunity). Aging can be viewed as a dimension along which those factors may systematically change over time. For example, Rhodes's (1983) model of age-related differences in work behavior showed how physiological aging processes can negatively affect the basic cognitive and psychomotor abilities required to successfully perform work activities. Conversely, previous research has shown how another time-related factor associated with work-related ability, level of work experience, is positively related to job performance (McDaniel, Schmidt, & Hunter, 1988; McEnrue, 1988). Schmidt, Hunter, and Outerbridge (1986) tested a causal model of work performance that included the length of work experience as a factor in the prediction of performance and reported that work experience had a direct causal effect on degree of job knowledge. Degree of knowledge in turn positively affected work performance.

Similar conflicting evidence has been reported on aging and motivational aspects of work performance. Slocum, Cron, Hansen, and Rawlings (1985) suggested that the deadwood phenomenon often associated with older employees is at least partially attributable to the prevalence of low work motivation among them. Conversely, Rhodes (1983) reviewed research evidence showing tendencies for higher commitment, lower turnover, and less voluntary absenteeism among older employees than among younger ones, suggesting that motivational levels were higher for the older employees.

The contradictory theoretical and empirical evidence regarding age in relation to both ability and motivation coincides with the mixed results that previous research has generally reported for age and work performance

(Rhodes, 1983). Recent meta-analyses seeking to address those discrepancies have shown that, on the average, age alone accounts for little variance in work performance (McEvoy & Cascio, 1989; Waldman & Avolio, 1986). However, as noted above, two studies have shown length of work experience to be consistently and positively related to work performance (McDaniel et al., 1988; Schmidt et al., 1986). Such experience involves the development of well-practiced work skills that a person can accumulate working in an occupation, perhaps in more than one organization during a career (McDaniel et al., 1988). Experience defined in this manner is a more comprehensive time-related indicator of performance than chronological age. One of the purposes of the current investigation was to compare the power of age and of experience in predicting work performance. We expected that experience would enhance the predictive power of age. Thus, in line with recent work by McEnrue (1988), we expected that

> Hypothesis 1: Length of experience will contribute to the
> prediction of work performance beyond the contribution
> of age.

Context and Aging Processes

In an attempt to explain the variability in previous research findings, Waldman and Avolio (1986) proposed that occupational type might moderate the relationship of age and work performance. To understand the theoretical reasons for that potential moderation, it is necessary to consider the third primary determinant of work performance Blumberg and Pringle (1982) identified—the job and work environment context. Those researchers used the term opportunity factors to describe factors external to individuals that can directly and indirectly affect their work performance. Waldman and Spangler (1989) called the same factors "context." Direct contextual factors include the physical environment in which a person works and the availability of the resources (e.g., tools and equipment) necessary to accomplish tasks effectively. Indirect contextual factors, which affect work performance by influencing an individual's work-related competence or motivation, may include job or occupational characteristics and organizational policies (Waldman & Spangler, 1989).

Other researchers have offered a theoretical framework (Gribbin, Schaie, & Parham, 1980; Labouvie-Vief & Chandler, 1978) explaining how aspects of context not only affect short-term performance but also accrue over time and affect ability and motivation. Acting in a manner similar to the environmental mediating factors that Rhodes (1983) described, contextual factors like the level of skill and degree of mastery needed for a job may enhance relationships between age and work performance. Jobs that are stimulating or that enhance skill development over time may positively affect work performance. Conversely, a job that is simple or highly routine may over time produce an incumbent who is unchallenged, bored, and eventually a below-standard performer. Consequently, what appears to be a decline in performance with increasing age may be the result of accumulated boredom or

burnout. Consistent with this argument was Sparrow and Davies's (1988) report that the strength of the relationship between age and the quality of job performance depended on the level of a job's complexity. Peak performance occurred at a significantly higher mean age in jobs involving greater levels of task complexity. Long-term experience working in such jobs may also help maintain an individual's cognitive abilities more than experience in less cognitively engaging jobs (Avolio & Waldman, 1987). Thus, we expected that an occupational classification scheme taking aspects of complexity and mastery into account would help account for systematic differences in the relationship of age and work performance. In sum,

> *Hypothesis 2: Occupational type will moderate the linear relationship between work performance and age or experience. Specifically, age or experience in jobs requiring a high level of skill or of professional mastery will explain more variance than will age or experience in less complex jobs.*

Linearity Issues

An important theoretical possibility previous research has often overlooked is that age (or experience) may be nonlinearly related to work performance for many jobs. Schmidt, Hunter, Outerbridge, and Goff (1988) predicted that experience beyond the level needed to perform a job maximally would not benefit performance and might actually be detrimental. Their reasoning was that the most important gains in performance attributable to experience are typically realized early in a career, with returns diminishing over time. Research evidence to date has provided mixed evidence regarding the presence of a plateauing effect (Lawrence 1988; McDaniel et al., 1988; McEvoy & Cascio, 1989). Remaining unanswered is the question of the generalizability of nonlinear plateauing in work performance in different occupations over peoples' life spans.

The same types of occupational qualities that serve to enhance linear relationships between work performance and age and experience will also reduce nonlinear plateauing effects. In jobs requiring high levels of skill and mastery, the experience learning curve should be more gradual than it is in less complex jobs, so gains in performance can accrue from lengthy experience. Conversely, in jobs requiring lower levels of skill and mastery, people should realize performance gains from experience sooner, resulting in a more rapid plateauing of performance. Moreover, because of the potential for boredom or burnout associated with such work, the performance pattern may become negative for older employees. Mathematically, this pattern could be mapped as an inverted U-shaped function. However, such instances should occur infrequently in work places because most older employees would voluntarily leave such situations to avoid failure or be dismissed or transferred into more suitable positions by their employers. Thus,

> *Hypothesis 3: Occupational type will moderate the nonlinear relationship between work performance and age or*

experience. Specifically, occupations characterized by
low levels of required skill or professional mastery will
account for more nonlinear variance than occupations
with high skill or mastery requirements.

METHODS

Data Description and Measures

·The United States Employment Service, a branch of the Department of
Labor, created the data base used in this research.[1] These cross-sectional
data on 24,219 individuals in the U.S. work force were collected between
1970 and 1984. The data base includes information on individuals' personal
characteristics, ability, jobs, and work performance.

Data were collected from individuals employed in the private sector in
a number of the major job categories mentioned in the *Dictionary of Occu-
pational Titles* (DOT). Occupations include such areas as manufacturing,
clerical work, sales, machinery construction and repair, health care, service,
and technical operations. The data base was originally created as part of a
series of selection validation studies conducted by the United States Em-
ployment Service for private industry. The purpose of that validation effort
was to determine if certain cognitive, psychomotor, and perceptual tests
could be used to help companies select employees more effectively. The data
were collected from 111 distinct groups of individuals. To maximize the
amount of data, the effort was designed so that each of the 111 groups
contained individuals with the same DOT job code who worked in a number
of organizations participating in the same validation·study. Across the 111
groups, individuals ranged in age from 18 to 74.

Age and experience. Respondents were asked to give their age on a
self-report form that also included questions on job experience. Anonymity
was assured. The amount of employer-specific job experience was gathered
with "How much experience (in years and months) have you had in your
present job with your present employer?" Total job experience was mea-
sured with "How much experience (in years and months) have you had in
your present occupation? Include time with both your present and previous
employers." Most previous research has measured experience with respect
to the number of years an individual worker has performed in a job within
a particular organization (e.g., McEnrue, 1988; Schmidt et al., 1986). With a
few exceptions (e.g., McDaniel et al., 1988), studies have typically not de-
fined experience as the total number of years an individual has accumulated
in a particular occupation, doing the same or similar jobs, perhaps in dif-
ferent organizations. We used the measure of total job experience gathered
by the United States Employment Service because, as was discussed previ-

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[1] The United States Employment Service provided this data base to the current authors for
use in this study.

ously, people may accumulate relevant knowledge and skills across jobs in different organizational settings that can have an impact on their work performance.

Occupational classification. The 111 jobs were categorized in two ways. First, we sorted the jobs into five occupational groups paralleling Gottfredson's (1986) occupational taxonomy, in which occupations are categorized in terms of the work performed or the product produced and the skill and intellectual levels required. Partitioning jobs into occupations based on products produced should also improve the comparability of measures of performance. Second, we gave two judges detailed definitions of the five occupational categories and asked them to sort cards containing DOT job descriptions and titles for each job into the categories. The agreement rate between the two judges was about 81 percent. The two raters reclassified jobs they initially classified into separate categories. When the raters could not agree on a job's placement into an occupational group, it was dropped from further analysis. The result was that 20,632 individuals from 97 of the original 111 jobs were classified into the five general occupational groupings. A brief description of each occupational category and three representative jobs placed in the category for this research follow: *Craft I* jobs involve inspection of finished products, monitoring activities, and perhaps routine labor activities. Examples are machine tender garment folder, and quality control inspector. *Craft II* jobs involve tasks that require setting up complex operations, doing fine detail work, operating several machines, using a variety of tools, repairing machinery or systems, and extensive training. Examples are electronics technician, construction equipment mechanic, and welder. *Clerical I* jobs involve basic clerical functions like taking dictation, transcribing and copying data, filing reports, and operating a typewriter. Keypunch operator, stenotype operator, and inventory checker are examples. *Clerical II* jobs involve compiling records of transactions, verifying data, updating filing systems, performing clerical work in searching and investigating information contained in files, deciding on data to be put in files, and making calculations and supplying written information from files. Administrative clerk, medical records clerk, and classified ads clerk are examples. *Service* jobs involve dealing directly with the public in providing information, making suggestions, selling, and completing orders. Transportation agent, general salesperson, and waitress are sample jobs.

Work performance. Supervisors of respondents were asked to provide performance ratings on six items representing the quantity, quality, and accuracy of individuals' work and their job knowledge, efficiency, and overall performance. Responses were on 5-point scales. To rate accuracy, for example, supervisors were asked "How accurate is the work of this individual?", with responses ranging from "Makes very many mistakes. Work needs constant checking," to "Rarely makes a mistake. Work almost never needs checking." The six scales represent common dimensions of work performance characteristic of a wide range of jobs (Landy & Farr, 1983).

Supervisors were informed that the ratings were being collected for

research purposes only. They were to keep the ratings confidential and not show them to anyone in their companies. Supervisors were instructed not to rate an individual unless that person had been under their supervision long enough to allow for accurate performance ratings. Other instructions or cautions to supervisors included rating on the basis of typical performance rather than on the basis of unique incidents and not letting general impressions or personal feelings about a worker affect ratings.

In general, each supervisor provided two sets of ratings, one week apart. The mean summed value of the ratings collected first was 21.75 (s.d. = 4.26). The mean summed value for the second set was 21.71 (s.d. = 4.29). Test-retest reliability for these ratings was .82. The internal consistency of the first ratings (α) was .91, and for the second set it was .93. Thus, in order to form a single, more reliable criterion, we summed the two sets of ratings for the present analyses. The mean value for this overall score was 43.46 (s.d. = 8.17).

Analyses

Hierarchical polynomial regression analysis (Cohen & Cohen, 1975) was used to test the hypotheses. For each of the five occupational groupings, we first entered age into a regression equation predicting work performance. We entered an age-squared term representing the quadratic function second, experience third, and an experience-squared term last. If nonlinearity had been present in the relationships between performance and age or experience, the higher-order squared terms should have accounted for increments in R^2. In addition, a positive beta coefficient would have indicated a potential U-shaped relationship, whereas a negative beta coefficient would have indicated an inverted U-shaped relationship (Kacmar & Ferris, 1989).

As Cohen and Cohen noted (1975: 100–102), a particular advantage of the hierarchical regression approach is that it overcomes some of the problems due to multicollinearity among independent variables like age and experience. Ordering independent variables a priori into a regression equation facilitates the interpretation of the amount of unique, semipartial variance for which they account.

RESULTS

For the overall data, the correlations between age and performance and experience and performance were .07 and .18, respectively. Table 1 shows means, standard deviations, and correlations among age, experience, and performance for each of the five occupational types. Across occupations, there was a general tendency for experience to be more highly correlated with performance than was age. In addition, and as expected, there were differences across occupational types, with higher correlations between performance and age or experience occurring for the craft II and clerical II categories, which include jobs with more skill complexity than jobs in the

TABLE 1
Means, Standard Deviations, and Intercorrelations by Occupational Type

Variables[a]	Means	s.d.	Age × Experience	Age × Performance[b]	Experience × Performance[c]
				Intercorrelations	
Craft I					
Age	34.60	11.44	.60	.06 (−.03)	.13 (.12)
Experience	5.88	6.51			
Performance	43.68	8.05			
Craft II					
Age	33.25	10.63	.69	.13 (−.04)	.23 (.19)
Experience	7.66	7.89			
Performance	42.81	8.06			
Clerical I					
Age	29.05	10.68	.61	−.03 (−.12)	.10 (.15)
Experience	4.68	5.08			
Performance	43.64	8.09			
Clerical II					
Age	29.45	10.50	.63	.11 (−.04)	.23 (.20)
Experience	4.79	5.59			
Performance	44.56	8.19			
Service					
Age	31.50	11.11	.59	.05 (−.06)	.12 (.13)
Experience	5.21	5.59			
Performance	43.89	8.47			

[a] Experience and age are reported in years. For the occupational types in the order listed, $N = 3,301, 9,008, 2,125, 2,937$, and $3,261$.
[b] The values in parentheses are the correlations between age and performance with experience controlled.
[c] The values in parentheses are the correlations between experience and performance with age controlled.

craft I and clerical I categories (Gottfredson, 1986). Table 1 also shows how the age and performance correlations seemed to drop substantially when experience was controlled. Conversely, the experience and performance relationships changed very little when age was controlled. The partial correlations confirmed the findings of previous research (Giniger, Dispenzieri, & Eisenberg, 1983; Schwab & Heneman, 1977).

Table 2 shows the results of the hierarchical polynomial regression analyses. As Hypothesis 1 predicted, for each occupational type, experience adds significantly to the prediction of performance beyond the contributions of age and age squared. The R^2 terms for age and experience tend to be highest for craft II and clerical II occupations, showing modest support for Hypothesis 2. For example, the ΔR^2 experience term for craft I occupations was .017, as compared to .040 for craft II occupations. Little support emerged for Hypothesis 3 in that the age-squared and experience-squared terms consistently accounted for a small and uniform percentage of variance across the five occupational types. One possible exception was that the ΔR^2 age-squared

TABLE 2
Results of Hierarchical Regression Analysis[a]

Predictor Variables	Occupational Types														
	Craft I			Craft II			Clerical I			Clerical II			Service		
	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
Age	.45	.004	.004	.34	.018	.018	.21	.001	.001	.09	.013	.013	.25	.000	.000
Age squared	-.51	.012	.008	-.40	.026	.008	-.58	.019	.018	-.16	.020	.007	-.34	.007	.007
Experience	.41	.029	.017	.54	.066	.040	.38	.038	.019	.58	.061	.041	.33	.023	.016
Experience squared	-.26	.037	.008	-.28	.073	.007	-.21	.045	.007	-.34	.078	.017	-.19	.028	.005

[a] Most R^2 values were statistically significant. The exception was age for clerical I and service occupations. The number of significant effects was due at least in part to the large numbers of people in each group.

term for clerical I occupations was slightly higher than the age-squared term for clerical II occupations.

To help interpret the age-squared and experience-squared effects, we provide plots of age and experience by performance in Figure 1. We created five age groups using a categorization scheme similar to one employed by the U.S. Department of Labor (cf. McLaughlin, 1989). The percentages of individuals in the 24-and-under, 25–29, 30–39, 40–54, 55-and-up age groups were approximately 27, 21, 25, 21, and 6 percent. This distribution approximately represents the U.S. labor force although, as mentioned previously, the pattern in recent years reflects a shift toward more representation of the older groups. We partitioned experience so that similar percentages of individuals would be in the five experience and the five age groups. Figure 1 shows a consistent plateauing effect for both age and experience in relation to performance across the five occupational types. Generally, there was no evidence to support the existence of an inverted U-function relationship between age and performance, although such an effect does appear to be present for clerical I occupations, where a drop-off in performance is evident for older employees.

DISCUSSION

The results of this study support the findings of earlier research and add new information that may help to redirect future research on age and work performance. In line with previous findings, length of job experience was a better predictor of work performance than was age (Giniger et al., 1983; McDaniel et al., 1988; McEnrue, 1988; Schwab & Heneman, 1977). However, previous research has not been clear on the extent to which occupational type might serve as a moderator or on the generality and nature of nonlinear plateauing effects when age and experience are compared (cf., McEvoy & Cascio, 1989). The present findings showed a modest moderating effect for occupational type in that both age and experience predicted performance better for jobs requiring higher levels of complexity or mastery than other jobs. A consistent, nonlinear plateauing effect emerged for both age and experience in relation to performance across the five occupational types. Moreover, for lower-level clerical jobs, some tendency was found for a decline in performance among older employees.

The present study attempted to add to the existing literature by examining occupational differences at a more specific level of analysis than has been done previously. The two most comprehensive examinations of previous research on age and work performance (McEvoy & Cascio, 1989; Waldman & Avolio, 1986) used a professional-nonprofessional occupational breakdown. The authors of both studies admitted that this sort of occupational breakdown might be too general, and each recommended a more detailed analysis of occupational type's effect on the age-performance relationship. Although the present study provided a somewhat more refined breakdown for nonmanagerial work, additional research is necessary for other

FIGURE 1
Performance Trends and Occupational Types
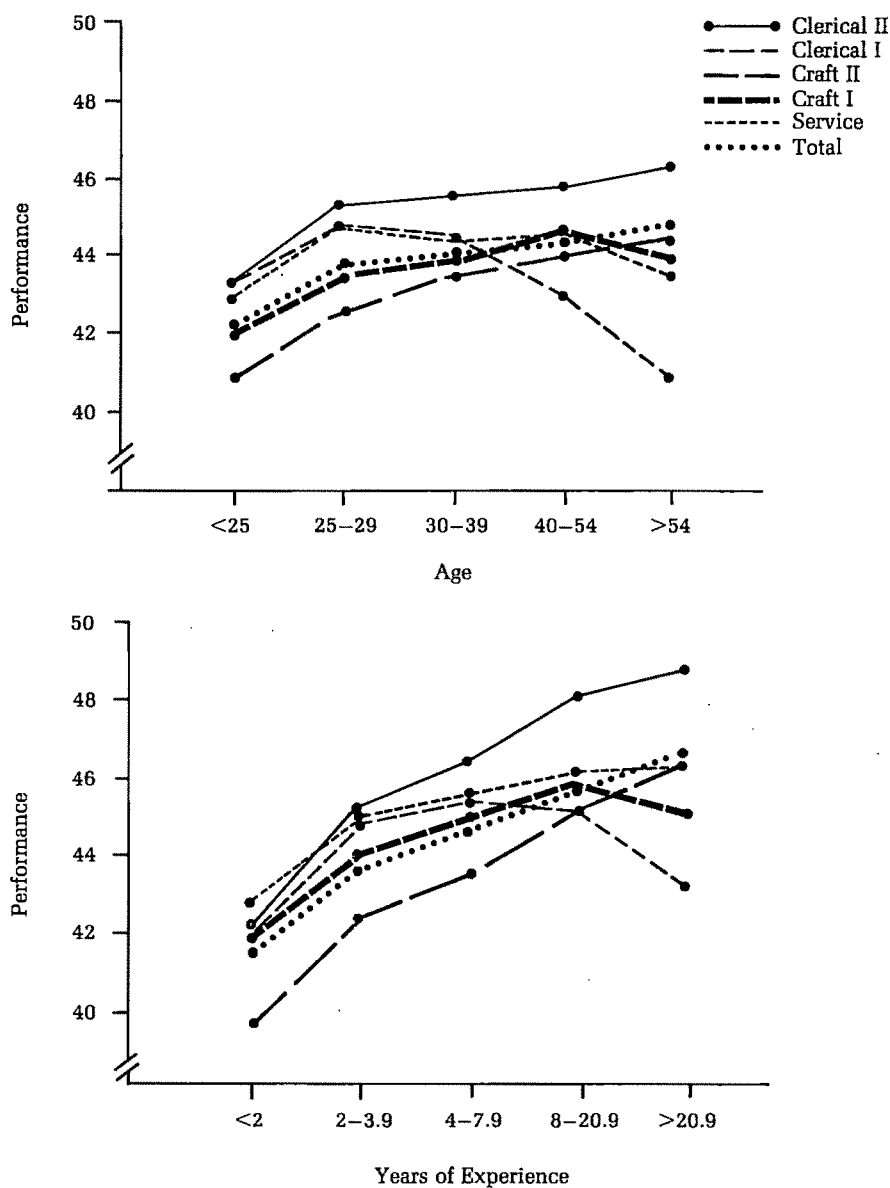
occupational characteristics that may display potential aging effects. For example, physically or psychologically stressful work may show more negative or nonlinear effects with regard to the age-performance relationship.

The obtained differences between occupations suggest that there are probably other aspects of work contexts that may affect ability, motivation, and performance over time and therefore have an impact on the age and

performance relationship. For example, there may be time-lagged effects associated with reward systems that individuals experience late in their careers. Cosier and Dalton (1983) proposed an alternative to the usual view that equity beliefs are static by suggesting that perceptions regarding the equity of reward systems can build over time and affect performance. The implication is that an older employee who has experienced fair reward systems over the years will tend to remain more motivated than an older employee who has not perceived such equity in a reward system. This explanation is consistent with Rosen's (1988) nationwide survey of over 4,000 human resource managers. Rosen reported that respondents saw loss of motivation and complacency as the most important factors in causing mid- to late-career problems such as obsolescence, resistance to change, and declines in performance.

Much writing dealing with job challenge and obsolescence has also argued for a focus on contextual effects that can build over time to affect work behavior (Fossum, Arvey, Paradise, & Robbins, 1986; Howard & Bray, 1988). The implication for future research is that there is a need to come to a better understanding of the specific types of work experiences and employment practices that may affect the relationship between age and work performance. To some extent, longitudinal research may be necessary for a precise understanding of how contextual factors operate over time to affect performance (Howard & Bray, 1988).

A primary assumption of the current research was that characteristics associated with an occupation may affect performance over time. However, another possibility is that better performers get promoted out of lower-level jobs, so that the older employees who remain are poorer performers. This pattern may have characterized the 55-and-over age group in the clerical I occupations, and the possibility deserves closer scrutiny in future research.

Practical Implications

Combined with prior research, the results of this study offer several implications for human resource management. From an employer's perspective, one advantage of hiring older people is their accumulated experience. The present findings suggest that although such experience may be important, it may be especially useful if it has been in jobs with high complexity but may give diminishing returns if it has been in less complex jobs. Maximizing life-span work performance will likely require a more judicious examination of the types of work experiences people accumulate within and between occupations.

These results also offer inferences for job design and development. Performance in routine, noncomplex work may flatten or decline more quickly over time if employees become bored with such tasks. The noncomplex work represented here included low-level clerical jobs, inspection and monitoring, and repetitive assembly operations. This problem will be compounded as entry-level-worker qualifications rise with an increase in the

level of education work force members have attained. Similarly, physical or psychological stress in an occupation may have deleterious effects on performance with increasing age, regardless of the specific tasks performed. For instance, performance may decline with age in some health care jobs because of burnout rather than because of individual capabilities (Motowidlo, Packard, & Manning, 1986). Thus, by altering specific tasks within a job or providing employees with certain developmental opportunities at key points in their careers (Howard & Bray, 1988), firms may improve work performance throughout employees' careers.

Running counter to such possibilities is the practice of providing the more intellectually challenging tasks and developmental opportunities available to younger employees. Although this strategy is instrumental to the long-term development of the younger employees, it may have a negative effect on older employees' ability and their motivation to avoid obsolescence (Fossum et al., 1986). Exacerbating this problem is the practice of reducing promotional opportunities for those who have reached certain ages.

Apart from job characteristics themselves, organizational policies may affect the type of age-performance relationships we observed. In this regard, organizations need to take a more active role in career planning across people's working life spans. For example, there must be incentives for workers to maintain and upgrade skills, to avoid unnecessary plateaus, and to minimize skills obsolescence. Rosen (1988) estimated that skill obsolescence was on the rise in the work force, which represents an important problem for human resource managers to consider. The absence of policies or procedures directed toward maintaining high levels of work performance among senior employees may not only affect those employees, but may also have a negative effect on younger workers. The latter may develop expectations that at some point in their careers, investment in upgrading skills will no longer be beneficial (Lawrence, 1988; Rosen, 1988).

Economic realities could weaken the value of orienting human resources programs and organizational policies toward older employees. Evidence exists that in some instances, the ratio of performance to pay is lower for senior employees (Medoff & Abraham, 1981). Older employees may have higher salaries than younger ones because of accrued pay increases, partially due to cost-of-living adjustments, but may not be performing at a comparably higher level. This will especially be the case when labor-market salaries for entry-level employees have not increased at commensurate rates. Combined with the costs of retraining, such conditions could lead to policies that encourage early retirement rather than training to avoid skills obsolescence. However, a direct interpretation of the data regarding the relationship of pay to performance for younger and older workers may be misleading. For example, Andrisani and Daymont (1987) reported that pay raises were nonlinearly related to age for age ranges similar to those included in the current study. In addition, the single most important factor Andrisani and Daymont found to account for differences across working life spans in earnings and

productivity was the investment organizations made in training their workers. Accumulating new skills and upgrading old ones were the single best predictors of earnings and productivity.

As long as organizations have policies based on the assumption that younger workers offer more time before retirement in which a firm can amortize the costs of training and reap its benefits, the likelihood of skills obsolescence among senior employees remains high. From a purely economic perspective, the question that human resource practitioners must address is whether the opportunity costs associated with training are more or less than the opportunity costs associated with improving productivity across a life span. Andrisani and Daymont's (1987) work demonstrated that younger employees' earnings and performance may overtake those of older employees because of the direct investment that employers—and perhaps the younger employees—make in training. In sum, decisions to retain or hire older employees and to take steps to maximize their performance will have to be balanced with regard to costs and benefits, legal concerns, and corporate responsibility regarding the development of all individuals, young and old alike.

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RESEARCH NOTES

USING RELATIVE DEPRIVATION THEORY TO EXPLAIN SATISFACTION WITH INCOME AND PAY LEVEL: A MULTISTUDY EXAMINATION

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This article reports four studies in which we applied relative depriva-
tion theory to the prediction of satisfaction with income and pay level.
The proposed model specified both social comparisons and a variety of
self-comparisons as important for understanding satisfaction. Using
four large samples of respondents and various measurements of the
theoretical constructs of interest, we found considerable support for the
model. Implications for future research are discussed.

The study of pay satisfaction has been and continues to be a popular research topic (e.g., Adams, 1965; Dyer & Theriault, 1976; Goodman, 1974; Heneman, 1985; Patchen, 1961; Scarpello, Huber, & Vandenberg, 1988; Weiner, 1980). Although previous work has clearly expanded our under-standing of pay satisfaction, most research in this area has been conducted using workers from a single organization or occupational category. That narrowness of focus may help explain why the empirical status of these models is not completely clear. For example, although considerable data support the equity-theory notion that people evaluate current pay via social comparisons (Dreher, 1981; Goodman, 1974; Heneman, 1985; Ronen, 1986; Scholl, Cooper, & McKenna, 1987; Weiner, 1980), other data suggest that social comparison may not be an important predictor of pay satisfaction (Berkowitz, Fraser, Treasure, & Cochran, 1987).

These empirical problems have also led some authors to argue that although a good deal is known about pay satisfaction, researchers need to propose and test other, more general models (Berkowitz et al., 1987; Green-berg, 1987a,b; Scholl et al., 1987). Martin (1981), for example, highlighted the importance of relative deprivation theory, which emphasizes relative

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versus absolute rewards, for explaining satisfaction with organizational rewards. Crosby (1984) also examined how relative deprivation theory might explain issues of dissatisfaction in organizations. DeCarufel (1986) more specifically advocated the use of relative deprivation models to explain dissatisfaction with pay.

The current research applied Crosby's (1976) relative deprivation model to satisfaction with pay level.[1] Although other relative deprivation models are available, notably that of Folger, Rosenfield, Rheaume, and Martin (1983), Crosby's approach is the most elaborate (cf. Martin, 1981). She suggested that satisfaction with pay level is not solely a function of actual pay but also of several judgments that individuals make. Crosby maintained that six important judgments are preconditions to feelings of dissatisfaction about outcomes, including pay. People will feel dissatisfied and resentful about the level of an outcome when (1) there is a discrepancy between the outcome they want and what they receive, (2) they see that a comparison other has more than they do, (3) past experience has led them to expect more than they now have, (4) future expectancies for achieving better outcomes are low (cf. Cook, Crosby, & Hennigan, 1977), (5) they really feel they deserve or are entitled to more, and (6) they absolve themselves of personal responsibility for the lack of better outcomes.

Crosby's model offers two basic advantages that researchers in organizational behavior can exploit (cf. Crosby, 1984; Martin, 1981), especially those interested in pay satisfaction (deCarufel 1986). First, the model not only includes an equity discrepancy, but also specifies how several self-discrepancy constructs (wants, past and future expectations, and entitlement) might play important roles in predicting satisfaction with pay level. Second, in one model Crosby included many of the subjective predictors that other work on pay satisfaction has identified (cf. Berkowitz et al., 1987; Heneman, 1985).

In fact, relative deprivation theory includes discrepancy terms that are components of other models. For example, Lawler (1971) contended that pay satisfaction is a function of the perceived discrepancy between current pay and the amount of pay that should be received. He theorized that the "should be" standard that individuals use depends on a number of factors, including actual pay, wage history, and the perceived pay of referent others. Relative deprivation theory includes those components as well as aspects of other related models, such as Adams's (1965) equity variable and Locke's (1976) want variable. Furthermore, relative deprivation theory adds unique constructs not present in related models, such as personal responsibility and future expectations.

In this research, we used several samples, three gathered nationally, to

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[1] Previous research has shown that pay satisfaction is composed of several factors, including pay level, pay administration, and benefits (Heneman & Schwab, 1985). We chose to focus on pay level satisfaction for two reasons. First, a good deal of prior research has also taken that focus. Second, the surveys used simply did not assess other aspects of pay satisfaction.

provide the first application of relative deprivation theory to satisfaction with income and pay level. Although some studies (e.g., Scholl et al., 1987) have examined several of Crosby's six preconditions, their simultaneous independent effects have not been investigated. Furthermore, following Heneman's (1985) admonition, we controlled for the respondents' actual pay levels before examining the more complex relative deprivation constructs (cf. Schwab & Wallace, 1974). In addition, prior research has relied exclusively on samples from single organizations. In contrast, using national probability samples of employees allowed us to make wide inferences about the attitudes of American workers toward pay. To increase confidence in our conclusions, we also tried to replicate the results from the national samples in a large group of workers from one organization. Collection of those data allowed us to include multiitem measures that even more directly tapped the relative deprivation preconditions than the measues used in the first three studies. In general, the main issue addressed in this research was whether Crosby's (1976) preconditions for relative deprivation significantly predicted pay level satisfaction above and beyond a worker's actual level of pay.

STUDY 1

Methods

The data came from a research project of the Survey Research Center of the Institute for Social Research (ISR) at the University of Michigan entitled "Economic Incentives, Values, and Subjective Well-being." The survey, conducted during October and November 1973, was designed to measure the psychological and objective bases of economic well-being. Although these data were collected prior to the formation of Crosby's (1976) theory, the survey included measures of relative deprivation predictors as indicators of psychological well-being.

These data were collected through a multistage, area probability sampling procedure that represented Americans age 18 and over. In all, 1,297 people participated in the survey. Since the current research examined the income satisfaction of people receiving pay and the subjective determinants of this construct, we eliminated respondents who did not work, were retired, or were currently unemployed. Since self-employed individuals determine their own income, they were also dropped, leaving 665 usable respondents. We used a "listwise" deletion procedure to conduct our analyses: if a question did not apply to an individual—for example, a question on past expectations might not apply to new workers—or if a respondent left an item blank, we eliminated the individual's data from the analysis. Data from 550 people remained for use in our analyses. The Appendix gives the actual questions used.

Results

Table 1 contains the descriptive statistics for the variables in the first study. We analyzed our data using a two-step hierarchical multiple regres-

sion analysis with satisfaction with income level as the dependent measure. Actual income was entered at the first step and the six relative deprivation preconditions at the second. Table 2 gives the results of this analysis.[2]

As can be seen, actual income level did significantly affect income satisfaction.[3] Not surprisingly, those with higher incomes were on the average more satisfied than those with lower incomes. More interestingly, four of the six relative deprivation preconditions were significant. As workers' want for more income increased, so did their dissatisfaction with existing income. Also, to the extent that workers felt that their last pay increase was lower than they deserved and that they were worse off financially now than they were a year ago, income dissatisfaction resulted. Finally, workers whose pay fell short of the pay of similar others experienced income dissatisfaction. Taken together, the relative deprivation variables produced a significant increment in R^2 at the second step of the regression analysis.

STUDY 2

At least one problem with our first study was that it used single-item measures for six of the seven theoretical constructs studied. Thus, although we found support for several predictors, the error resulting from the single items might have reduced our ability to find stronger and wider effects of those predictors. The main goal of the second study, therefore, was to attempt to replicate the effects of relative deprivation theory found in the first study.

Methods

The data came from the same general ISR research project. A new survey sample was administered in October and November 1974, to a completely

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[2] We also conducted a hierarchical regression analysis that controlled for gender and age in addition to actual pay before the preconditions were entered into the equation. Since these variables failed to account for a significant increment in R^2 ($F < 2.00$), we report only the results with actual pay controlled. A similar pattern of nonsignificance also emerged for these variables in studies 2–4.

[3] A reviewer pointed out that our dependent measure—income satisfaction—might have been more inclusive than we intended because it might also tap satisfaction with other income sources, including a spouse's salary. To address this issue, the reviewer suggested that we compare respondents who were the sole source of family income with those who had spouses earning income. If our interpretation was correct, there would be little difference between these groups regarding the impact of the relative deprivation preconditions. We recomputed our regression analyses using these subgroups. In no case did we find any reversal of effects: the four predictors that were originally significant were also significant in both subgroup analyses. Finally, there was only one significant difference in the betas between the subgroups. The beta for past expectations was $-.13$ for one-earner families but $-.34$ for two-earner families ($t = 2.75$, $p < .01$). In both cases, however, the predictor was significant. It should be noted, however, that this subgroup analysis was a weak test of the validity of this measure. For example, we were not able to isolate pay from other sources of personal income. Please see the results for studies 3 and 4, in which we used better measures of satisfaction with pay level and also found support for our predictions.

different group of 1,489 Americans age 18 and over. We used the same selection criteria as in study 1, which yielded 642 employed respondents. The Appendix again lists the items used.

Results

Table 1 contains the means, standard deviations, and intercorrelations for our variables. Once again, we analyzed our data using a two-step hierarchical multiple regression analysis with income satisfaction as our dependent measure. As before, actual income was entered at the first step and the six relative deprivation preconditions at the second. Table 2 presents the results of this analysis.

As Table 2 shows, actual income level significantly predicted income satisfaction: as income increased, so did satisfaction. More interesting are the significant effects found for the relative deprivation preconditions. As want for pay increased, so did income dissatisfaction. Also, as past expectations were not met, dissatisfaction with income resulted. Furthermore, a sense of earning less than what was deserved significantly predicted dissatisfaction. Finally, as the gap increased between people's perception of what similar others and they themselves earned, so did dissatisfaction with income. Future expectations and personal responsibility were not significant predictors of satisfaction.

TABLE 1
Descriptive Statistics and Intercorrelations for Studies 1 and 2[a]

Variables	Correlations[b]							
	1	2	3	4	5	6	7	8
1. Income satisfaction		.18	.38	−.11	.35	−.28	−.09	−.14
2. Salary	.29		.08	−.09	.09	.05	−.13	−.02
3. Entitlement	.38	.08		.04	.42	−.25	−.07	.17
4. Want	−.54	−.27	−.24		−.12	.08	.15	.02
5. Social comparison	.31	.14	.44	−.21		−.18	−.04	.13
6. Past expectations	−.34	−.03	−.24	.31	−.11		.11	−.06
7. Future expectations	−.14	−.03	−.03	.09	.02	.22		−.02
8. Personal responsibility	.16	.19	−.06	−.12	.06	−.02	.00	
Study 1								
Means	4.57	6.93	2.05	3.27	2.47	2.15	2.27	1.87
Standard deviations	1.26	3.79	0.98	1.24	0.89	1.20	1.46	0.78
Study 2								
Means	4.38	7.75	2.52	2.51	2.49	3.02	3.41	3.32
Standard deviations	1.43	3.88	0.83	1.10	0.86	1.74	2.08	1.23

  [a] Correlations for study 1 are above the main diagonal; $N = 550$. Study 2 correlations are below the main diagonal; $N = 642$.

  [b] Correlations greater than .07 are significant at $p < .05$ for both studies.

TABLE 2
Summary of Hierarchical Regression Results for Studies 1 and 2

Variables	Study 1			Study 2		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Salary	.15***	.03	.03***	.14***	.09	.09***
Entitlement	.22***	.26	.23***	.19***	.42	.33***
Want	−.11**			−.38***		
Social comparison	.18**			.11**		
Past expectations	−.21***			−.15***		
Future expectations	−.04			−.06		
Personal responsibility	−.06			.07		

* $p < .05$
** $p < .01$
*** $p < .001$

STUDY 3

In the first two studies, we found that four of the preconditions significantly predicted satisfaction with income level. Those studies were not, however, without drawbacks. For example, national samples specifically designed to measure Crosby's (1976) constructs were unavailable. Further, only a single item measuring satisfaction with income level was available as a dependent measure. Overall, we assessed six of the seven theoretical constructs using single-item measures. Thus, we conducted a third study to examine Crosby's model more clearly. This study, also based on a nationwide sample of workers, used multiitem measures of many constructs, including a direct measure of satisfaction with pay level.

Methods

The data for this study came from an ISR survey entitled "Quality of American Life, 1978." The sample represents individuals 18 years of age and older who lived in households within the coterminous United States. Interviews were conducted with 3,692 people from June 6 to August 10, 1978. We again dropped respondents who did not work or who were retired, currently unemployed, or self-employed. After listwise deletion, data from 633 people remained for analysis. The Appendix gives the items used.

Results

Table 3 presents the means, standard deviations, and intercorrelations for all measures used in the study. The data were again analyzed using a two-step hierarchical regression model, with pay satisfaction as our dependent variable. We entered self-reported pay level at the first step and the six relative deprivation preconditions at the second step. Table 4 summarizes this analysis.

Salary was a significant predictor of satisfaction with pay level, and at step two, five of the six preconditions were significant predictors. As a

TABLE 3
Descriptive Statistics and Intercorrelations for Studies 3 and 4[a]

Variables	Correlations[b]							
	1	2	3	4	5	6	7	8
1. Pay satisfaction		.25	.36	.35	.29	.23	.18	.25
2. Salary	.13		.22	.20	.64	.48	.44	.18
3. Entitlement	.65	.05		.29	.23	.23	.12	.20
4. Want	.43	.06	.39		.17	.12	.10	.34
5. Social comparison	.40	.26	.33	.21		.26	.26	.16
6. Past expectations	.16	.07	.10	.09	−.07		.33	−.09
7. Future expectations	.29	−.01	.29	.09	.09	.04		.06
8. Personal responsibility	.18	.20	−.04	.02	.13	.11	.18	
Study 3								
Means	3.08	14.89	2.36	4.02	0.05	2.62	2.94	1.39
Standard deviations	0.86	4.45	1.07	1.26	1.03	2.96	3.67	0.24
Study 4								
Means	−0.12	18,351.73	4.75	1.66	6.02	7.42	3.42	51.93
Standard deviations	2.59	10,059.45	1.74	0.51	1.54	2.28	1.15	5.83

[a] Study 3 correlations are above the main diagonal; $N = 633$. Study 4 correlations are below the main diagonal; $N = 675$.

[b] For study 3, correlations greater than .07 are significant at $p < .05$. For study 4, correlations greater than .06 are significant at $p < .05$.

group, the addition of these six variables yielded a substantial increase in variance accounted for. The entitlement and want variables were strong predictors of pay satisfaction: the greater the discrepancy between salaries and desired salaries and the more that people viewed that discrepancy as undeserved, the less satisfied they were. Similarly, the more respondents believed that comparison others had higher salaries and the less optimistic they were about future increases, the more dissatisfied they were with their pay. Finally, the more internally oriented respondents were about life events in general, the more satisfied they were with their current pay.

TABLE 4
Summary of Hierarchical Regression Results for Studies 3 and 4

Variables	Study 3			Study 4		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Salary	.25***	.06	.06***	.13**	.02	.02**
Entitlement	.29***	.25	.19***	.49***	.53	.51***
Want	.22***			.19***		
Social comparison	.17***			.17***		
Past expectations	.06			.06†		
Future expectations	.10**			.09**		
Personal responsibility	.12**			.15***		

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

STUDY 4

An obvious question that arises from the findings we have reported so far is whether we would find similar results using respondents from a single organization and more direct measures of key constructs. Thus, in this last study we sought to replicate the pattern of results observed in studies 1–3 with data from a single organization. We sought further support for the model to give us additional confidence in the usefulness of relative deprivation theory for understanding satisfaction with pay level.

Methods

Surveys were distributed to 1,100 employees of a large midwestern bank, who completed them on company time and returned them anonymously in sealed envelopes. A total of 675 employees completed the survey—a 61 percent response rate. The Appendix gives the items used.

Results

Table 3 presents the means, standard deviations, and intercorrelations for all measures used in the study. The data were analyzed using a two-step hierarchical regression procedure with pay level satisfaction as the dependent measure. We entered self-reported salary at the first step and the six relative deprivation preconditions at the second. Table 4 summarizes the results of this analysis.

Salary was a significant predictor of pay satisfaction. Respondents with higher salaries were more satisfied with their pay than those with lower salaries. Five of the six relative deprivation preconditions were also significant. The remaining precondition, past pay expectations, was marginally significant. Not surprisingly, the second step yielded a large increment in variance accounted for. The more discrepant salaries were from wants, the less satisfied respondents were with their pay. Similarly, the more respondents agreed that they had been paid better in past jobs and that comparison others had higher salaries, the less satisfied they were with their pay. In addition, the less respondents agreed that they were being paid what they deserved and could expect to be paid that way in the future, the less satisfied they were with their pay. Finally, the lower the level of personal responsibility they felt for their job outcomes, the less satisfied respondents were with their pay.

DISCUSSION

The results of all four studies suggest that the preconditions specified in Crosby's relative deprivation model are generally useful for explaining pay satisfaction. For example, across all four studies we found that to the extent respondents felt similar others earned more, dissatisfaction with income and pay resulted. These social comparisons were found to be important even after we removed variance shared with other predictors. In addition, desired pay (wants) was a significant predictor of income and pay satisfaction across

the four studies, independent of other predictors. Apparently, when desires regarding pay exceed current pay, dissatisfaction results. Also, judgments of entitlement or deservingness were found to be important predictors of satisfaction across the four studies. To the extent that people felt they earned less than they deserved, they were dissatisfied.

There were several other common findings across studies. Salary level was a significant predictor of pay and income satisfaction. Although not theoretically interesting, this finding highlights the point that by not controlling for pay level, prior research may have produced ambiguous estimates of the strength of some preconditions. Another common finding concerned the amount of variance that the preconditions accounted for. In all four studies, the preconditions accounted for at least three times the amount of variance that salary level alone represented. It is quite clear that pay level alone does not explain pay level satisfaction. Overall, Crosby's (1976) relative deprivation model appears to be useful for understanding such satisfaction.

The consistency of the results is especially impressive given the differences among these four studies. For example, studies 1–3 used national probability samples of American workers, whereas study 4 used respondents from a single organization. In addition, the studies differed in terms of the measures of relative deprivation they used. For instance, in study 3 respondents were asked to make social comparisons with family, friends, and workers in general, but respondents in studies 1, 2, and 4 were asked to make social comparisons with co-workers. Nevertheless, similar effects emerged in all the studies. This finding might indicate that workers rely on several sources of information, some internal and some external to their organization, to evaluate their pay (cf. Goodman, 1974; Ronen, 1986). It is unclear at this point, however, whether research has identified all the sources of information workers can and do use to evaluate their pay (cf. Berkowitz et al., 1987; Hills, 1980; Martin, 1981; Ronen, 1986). Crosby's model could be made more elaborate in regard to those sources.

There were also some differences across studies, however, concerning the support offered for the effects of particular preconditions. In studies 1 and 2, which used the same methodology and basically the same measures, we found that past expectations were significant predictors of satisfaction with income level, whereas future expectations and perceptions of personal responsibility were not. In study 3, we found that future expectations and personal responsibility did add to the prediction of pay level satisfaction, whereas past expectations did not. Finally, in study 4 we found that all six of the preconditions contributed to the prediction of satisfaction with pay level.

What is interesting about these differences is that they reveal a pattern of support for our model that, although good in general, improves from study 1 to study 4. Several factors may explain this pattern of increasing support: (1) the apparent ability of the measures used to assess the preconditions increased across studies, that is, face validity increased; (2) they generally

became more reliable; and (3) they were increasingly tailored to the people and the theory under study.

A final interesting difference across studies is that the preconditions in the single-organization data (study 4) accounted for more variance in pay level satisfaction ($R^2 = .51$) than they did in the data from the national samples (average $R^2 = .26$). The reasons for this finding are not exactly clear. One possible explanation may be the nature of the samples themselves. In any one company, it is more likely that workers share perceptions about policies, knowledge of personal and co-worker inputs and outputs, and much more. Thus, the covariance between pay level satisfaction and deprivation preconditions within a single company may differ from that in a national sample drawn from hundreds of companies. The drop in shared perceptions in a national sample may reduce the amount of variance accounted for. Clearly, however, this is speculation on our part.

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

Several features of this research are worth highlighting. First, we have presented the first examination of the ability of relative deprivation theory to predict satisfaction with income and pay level. As was mentioned, several other authors have noted the theory's potential usefulness in this area (de-Carufel, 1986; Martin, 1981), but little previous empirical research has emerged. Second, we found significant effects for the relative deprivation preconditions and were able to produce support for the model across studies. This research was a good initial step toward using relative deprivation models to help explain satisfaction.

A third advantage of our research was its use of both national and single-organization data. In a national sample, the peculiarities of any one company or geographical area cannot explain or constrain results. Three of our studies used samples that in fact accurately represented the frequency of occupational types and levels in the American work force. We also included an in-depth investigation of a single organization, which allowed us to tailor measurement of relative deprivation constructs, a luxury rarely available in research with national samples. This complementarity of methods is an important addition to research in this area since we showed that similar effects could emerge from a single organization and a national sample. Thus, we are confident that our results offer some valuable information about the determinants of satisfaction with income and pay level.

It should be noted that the present study was a cross-sectional examination of pay satisfaction. The addition of a longitudinal study of relative deprivation to the literature would be of considerable value. Many of the preconditions studied here are time-based, such as the self-comparisons with past and future pay levels, and longitudinal analysis might show these self-comparisons to be especially critical. Also, pay satisfaction may be more dynamic than is currently believed. A longitudinal study would shed light on those and other issues. A potential strength of the relative depriva-

tion model is that it makes predictions about how workers might resolve feelings of dissatisfaction about pay. Studies of the effects of relative deprivation constructs are also sorely needed since the theory's predictions differ from predictions based on other existing models of satisfaction with pay.

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APPENDIX

Measures Used in the Four Studies

Study 1

Satisfaction with income. How do you feel about the income you have? (1 = terrible, 7 = delighted)

Self-reported income. How much did you earn from your job last year before taxes? (Responses were placed into 18 categories)

Want. If your wages from your job were to go up just enough to cover the rising cost of living, would this be. . . . (1 = very satisfactory, 5 = rather disturbing)

Social comparison. How fair is what you earn on your job in comparison to others doing the same type of work that you do? (1 = not very fair, 5 = very fair)

Entitlement. Was your last pay increase. . . . (1 = less than deserved, 2 = about as much as deserved, 3 = more than deserved)

Personal responsibility (2 items, α = .81). (a) How much should skill and ability at doing your job count in pay decisions? (1 = much more than it does now, 5 = much less than it does now); (b) How much should the effort you exert on the job count in pay decisions? (same scale)

Future expectations. Looking ahead, do you think that a year from now you will be better off financially or worse off, or just about the same as now? (1 = better off, 5 = worse off)

Past expectations. Would you say that you're now better off or worse off financially than a year ago? (1 = better off, 5 = worse off).

Study 2

Items were identical to those used in study 1, with the following two exceptions:

Want. Do you feel that your income is enough to live. . . . (1 = very comfortably, 5 = not at all comfortably)

Personal responsibility. Some people feel that the federal government should see to it that everybody has a good standard of living. Others think the government should just let each person get ahead on his own. Which number comes closest to how you feel? (1 = government should see to standard of living, 5 = let each person get ahead on his own)[a]

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[a] The anchors equal to 1 represented an external orientation and those equal to 5 an internal orientation.

Study 3

Pay level satisfaction. How true is this statement about your job: The pay is good? (1 = very true, 4 = not at all true)

Self-reported income. How much did you personally earn, before taxes, in 1977? (Responses were placed into 26 categories)

Want. Do you worry that your income won't be enough to meet your expenses/bills? (1 = worry all the time, 5 = do not worry)

Social comparison (3 items, α = .53). (a) Thinking of most of the friends you feel closest to, would you say their incomes generally run. . . . (1 = a lot larger than yours, 5 = a lot smaller than yours); (b) Thinking of most of the relatives you feel closest to, would you say their incomes generally run. . . . (same scale as above); (c) Respondents estimated the average salary for people in the United States and the figure was substracted from their income.

Entitlement. Relative to other people, would you say that your income is. . . . (1 = less than you deserve, 5 = more than you deserve)

Personal responsibility (4 items, α = .54).[b] (a) Some people feel they can run their lives pretty much the way they want to, others feel the problems of life are sometimes too big for them. Which one are you most like? (1 = too big, 2 = run life); (b) Do you think it's better to plan your life a good way ahead, or would you say life is too much a matter of luck to plan ahead very far?; (c) When you do make plans ahead, do you usually get to carry things out the way you expected, or do things usually come up to make you change your plans?; (d) Have you usually felt pretty sure your life would work out the way you want it to, or have there been times when you haven't been sure about it?

Future expectations (2 items, α = .92). (a) What do you expect your income will be next year?; (b) What do you expect your income will be five years from now? (Respondents' current income was subtracted from each item to index future expectations.)

Past expectations (2 items, α = .80). (a) Thinking back to two years ago, what was your income then?; (b) Roughly speaking, what was your income five years ago? (Both values were subtracted from current income. Higher values thus show increasing income over the years.)

Study 4

Pay level satisfaction (3 items, α = .85). (a) The pay for my job is excellent (1 = strongly agree, 5 = strongly disagree); (b) I am satisfied with my current pay (same scale); (c) How do you feel about your pay? (1 = delighted, 7 = terrible)[c]

Self-reported income. What is your current salary? (Actual salary level was used in this study.)

Want. How does your current salary compare with the salary you want to have? (1 = want much more, 5 = want much less)

Social comparison (2 items, α = .54). (a) I think co-workers at my grade level are paid more than I am. (1 = strongly agree, 5 = strongly disagree); (b) I think employees below my grade level are paid more than I am. (same scale)

Entitlement (2 items, α = .71). (a) I feel my current pay is fair given my performance. (1 = strongly disagree, 5 = strongly agree); (b) I'm not being paid what I deserve now based on my performance. (same scale)

Personal responsibility (14 items,[d] α = .74). One example is given: Mastering this job is important to me. (1 = strongly disagree, 5 = strongly agree)

Future expectations. I expect that what I am paid in the future will be based on my performance. (1 = strongly disagree, 5 = strongly agree)

Past expectations (2 items, α = .91). (a) My current salary is less than what I've been paid in previous jobs (1 = strongly agree, 5 = strongly disagree); (b) I've made more in the past than what I'm making now. (same scale)

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[b] Two-point scales were used for all four items. The anchors equal to 1 represented an external orientation and those equal to 2 an internal orientation.

[c] This item came from Andrews and Withey (1976).

[d] These items came from Wagner and Morse's (1974) perceived work competence scale.

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The Eastern Academy of Management will hold its international meeting on June 9–13, 1991 in Sophia Antipolis, Côte d'Azur, France. The meeting's theme will be "Managing in a Global Economy." It will be hosted by CERAM, Centre d'Enseignement et de Recherche Appliques au Management. For more information contact:

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CONTENTS
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RESEARCH NOTES

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CONVERTING TO FOR-PROFIT STATUS: CORPORATE RESPONSIVENESS TO RADICAL CHANGE

ARI GINSBERG
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This study examined organizational adaptation to a radical environmental shift—a dramatic change in federal policies toward health maintenance organizations (HMOs) that removed key advantages of nonprofit status. To understand why some nonprofit HMOs responded more quickly than others in converting to for-profit status, we tested an inertial, an adaptive, an institutional, and an integrated model, using event-time analysis. Results indicate that age, the tightness of system coupling, physician case load, and market saturation lengthen response time and national chain membership, federal qualification, and supportive state legislation shorten it. Although variables from each of the models contributed to the explanation of response times, only the integrated model fit the data well. This study thus points to the complementarity of the three perspectives and underscores the need for an integrative approach to the study of organizational transformation.

A central debate among organizational theorists concerns the nature of organizational change (Romanelli & Tushman, 1986). Rational adaptation theorists view organizations as actors able to make prescient decisions that lead to survival-enhancing shifts (Pfeffer & Salancik, 1978). From this perspective, organizations change easily and speedily in response to various types of exogenous change (Ansoff, 1965). In contrast, natural selection theorists view organizations as complex systems severely constrained by external forces that create and institutionalize strong webs of commitment (Aldrich, 1979; Stinchcombe, 1965). From this perspective, organizations are inherently inflexible and slow in responding to changing environmental opportunities and threats, and they rarely engage in transformations (Hannan & Freeman, 1984). Whereas population ecologists have tended to focus on the dominating role of task environments, institutional theorists have tended to concentrate on the central role of institutional environments, me-

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diated by forces like regulation and legislative change (DiMaggio & Powell, 1983; Zucker, 1987a). Although both approaches attribute causal supremacy to the environmental context of organizations, the former emphasizes organizational competition, and the latter stresses the importance of organizational connectedness (Oliver, 1988).

Arguing that neither selection nor adaptation models adequately explain the occurrence of organizational change, some researchers have proposed integrative theoretical frameworks that emphasize the differential applicability of inertial and inductive tendencies (Burgelman, 1987; Hrebiniak & Joyce, 1985; Kurke & Ulrich, 1988). To identify the conditions that influence inertial or inductive tendencies, empirical research has begun to distinguish processes of change (Are older organizations less likely to undergo fundamental changes? Do older organizations respond less quickly to environmental shifts?) from their adaptive consequences (Does the occurrence of fundamental change decrease the probability of organizational survival? Do slower responses to environmental shifts increase the likelihood of survival?) (Singh, Tucker, & Meinhard, 1988). Although these efforts reflect important strides, there is still a paucity of empirical studies testing different models of responsiveness to environmental change.

To address that gap, we examined various models predicting the amount of response time that will precede conversion to for-profit status in the health maintenance organization (HMO) industry. Dramatic changes in the federal government's policies and in consumers' expectations have made the health care environment a rich setting for studying organizational responses to radical environmental shifts (Kimberly & Zajac, 1985; Zajac & Shortell, 1989). As a result of new government policies that favor for-profit status, the HMO industry has recently seen rapid growth in both the number of for-profit HMOs and the number of HMO members enrolled in for-profit plans. Having found themselves at a competitive disadvantage, many nonprofit HMOs have converted to for-profit status. The HMO industry thus provided a valuable setting for testing different models of corporate responsiveness to fundamental environmental changes.

THE HMO ENVIRONMENT

The Background

HMOs are organizations that provide comprehensive health services including not only the traditional physician and hospital care but also preventive health care like physical examinations and immunizations. They integrate insurance and health care functions by contracting for the delivery of future services for a fixed period in return for a fixed, prepaid amount of money (Luft, 1981; Rossiter, 1987). An HMO's members must receive care from a specified list of physicians with whom the HMO contracts.

HMOs first emerged in the early 1970s, when the Nixon administration began seeking alternatives to traditional fee-for-service health care providers (Luft, 1981). Some large prepaid group practices had existed for 30 to 40

years before the enactment of HMO legislation (Starr, 1982) but were considered to be outside the traditional health care field. They survived in spite of being "anathema to the medical care establishment" (Luft, 1981: 1). Largely as the result of resistance from physicians, early HMO plans experienced considerable difficulty with start-up (Harrison & Kimberly, 1982).

The Federal Health Maintenance Organization Act of 1973 was designed to increase the viability and the legitimacy of HMOs by providing loans and loan guarantees to nonprofit HMOs and requiring employers to offer HMOs as an insurance option to their employees. In some instances, for-profit HMOs could qualify for the federal loan program if they could prove that they were serving a medical population that had been underserved (McNeil & Schlenker, 1975). Amendments to the Health Maintenance Organization Act made in 1976 modified some of its more onerous aspects (Skolnick, 1977). These amendments made a number of required benefits optional, waived community rating requirements in a number of instances, and limited required periods for open enrollment. Essentially, the United States government served as a venture capitalist, providing start-up support and funding in an effort to launch a new industry (Iglehart, 1980).

Although these laws established the right of HMOs to do business, they did not provide them with immunity from the pressures of the marketplace. State regulations and physicians' attitudes continued to be major determinants of the success of HMOs (Wholey, Sanchez, & Christianson, 1988). Indeed, the first ten years of federal efforts to promote health maintenance organizations and to increase their prominence in the U.S. health care system accomplished relatively little in increasing public understanding of these organizations and in decreasing physicians' resistance (Brown, 1983). Since 1975, intense competition and pressure from both policy makers and the public to reduce costs have characterized the health care environment (Marmor, Schlesinger, & Smithey, 1987). Many HMOs have struggled to survive and some have failed entirely (Interstudy, 1987).

The Logic of Conversion

In the view of a number of analysts, the HMO movement was transformed into the HMO industry in 1983, when the federal government officially withdrew the loan programs available to nonprofit HMOs and only the largest nonprofits had sufficient debt capacity to cover their capital requirements (Birnbaum, 1987; Wholey et al., 1988). An increased acceptance of for-profit HMOs by state regulators accompanied this Schumpeterian shock to nonprofit HMOs (Houck & Mueller, 1986). As a result, the number of for-profit HMOs and their enrollments grew rapidly, and national HMO firms began to develop while nonprofit participation began to decline (Interstudy, 1985).

With the loss of federal support, for-profit HMOs enjoyed competitive advantages enough to strongly outgun the nonprofit HMOs (Marmor et al., 1987). Nonprofit providers had been expected to cross-subsidize less profitable services with excess revenues from services that generated a profit

(James, 1983; Harris, 1979). However, because the pricing behavior of for-profit providers forced them to price these formerly profitable services very competitively, they could no longer use their revenues as a source of cross-subsidization (Marmor et al., 1987). For-profit organizations were also not subject to state and federal regulations that limited the businesses in which nonprofits could operate and the fiduciary policies they might implement (Simon, 1987). Therefore, for-profit HMOs could offer equity incentives, profit sharing, and bonuses. This ability in turn made them more effective than nonprofit organizations at recruiting physicians and managers (Houck & Mueller, 1986).

For-profit HMOs enjoy greater strategic latitude than nonprofits in other important ways: it is easier for them to enter into joint ventures or mergers with for-profit entities like insurance companies (Wallace, 1986); they can more readily diversify into another business (Houck & Mueller, 1986); and they enjoy a simpler and more flexible administrative structure (Dunn, Shields, & Stern, 1986). In contrast to for-profit HMOs, nonprofits are constrained in their access to capital and ability to grow because they do not have the option of issuing equity (Hansmann, 1987). Nonprofit HMOs tend to have a lower return on investment than their for-profit competitors because nonprofit organizations may not distribute earnings (Hansmann, 1987). The strategic latitude that for-profit status provides is particularly important to organizational survival in an environment that is both highly competitive and dynamic. This may explain recently reported performance differences between nonprofit and for-profit HMOs: 54 percent of HMOs reporting a profit or surplus for fiscal year 1988 were for-profit, and only 46 percent were nonprofit (Interstudy, 1989).

CORPORATE RESPONSIVENESS

To alleviate these competitive pressures, a number of nonprofit HMOs have converted to for-profit status, a move that reflects an HMO industry trend (Birnbaum, 1986). Recognizing the competitive advantage of for-profit status, new entrants into the HMO industry have overwhelmingly chosen for-profit status (Wallace, 1986). Although 30 percent of the 26 million current HMO members are enrolled in nonprofit plans, enrollment in for-profit plans has been growing at a faster rate: there was 19 percent growth during 1986 for the latter versus 3 percent growth for nonprofit HMOs (Wholey et al., 1988). However, despite the pressures fundamental changes in federal policy have generated, some nonprofit HMOs have responded much more slowly than others in converting to for-profit status. These different speeds of response may reflect three important concepts: inertia, flexibility, and isomorphism.

Inertia

The concept of inertia, like that of fitness, refers to a correspondence between the behavioral capabilities of a class of organizations and their particular environments (Hannan & Freeman, 1984: 152). The speed of an

organization's response relative to that of other organizations with which it competes for resources thus reflects inertia. Hannan and Freeman (1984) cited the semiconductor industry as an example. Although the behavior of the slowest-changing semiconductor firms over the last 20 years would have made them remarkably flexible entities in other industries, many have not been able to reorganize quickly enough to keep up with the changing technologies in their industry.

Another relative aspect of inertia concerns the costs of building new organizations to take advantage of a new set of opportunities. As Hannan and Freeman (1984) observed, if existing organizations cannot change their strategies and structures more quickly than entrepreneurs can begin new organizations, new entrants into an industry will have a chance to establish footholds. Thus, the faster competitors can enter the industry in the form the environment favors, the greater the relative inertia of a set of existing structures (Hannan & Freeman, 1984).

Flexibility

Aaker and Mascarenhas defined flexibility as "the ability of the organization to adapt to substantial, uncertain, and fast-occurring (relative to reaction time) environmental changes that have a meaningful impact on the organization's performance" (1984: 74). Flexibility reflects not only speed of response, but also an organization's ability to reduce the impact of an environmental change and the costs of responding to it (Ansoff, 1965; Eppink, 1978). A delayed response may therefore indicate an organization's ability to limit the impact of an environmental shift or its inability to make the costs of changing worthwhile (Friesen & Miller, 1986).

Although both characterize the speed of an organization's response to environmental change, inertia and flexibility reflect different theoretical heritages. The former, which dominates the traditional population ecology literature, emphasizes organizational tendencies toward containment. Such tendencies have less to do with managers' abilities to sense and interpret economic pressures for change than with the structural or procedural baggage that organizations accumulate over time. These tendencies toward ossification suppress organizational motility and increase response times (Hannan & Freeman, 1984). In contrast, the concept of flexibility, which dominates the rational adaptation and strategy literatures, emphasizes organizational tendencies toward inducement and mobilization. The speed of an organization's response has less to do with tendencies toward ossification than with economic forces that influence the desirability of changing quickly (Friesen & Miller, 1986).

Isomorphism

In contrast to both inertial models of responsiveness emphasizing norms of reliability and bureaucracy and adaptive models emphasizing economic pressures, institutional models emphasize isomorphic tendencies. Models based on the concept of isomorphism, which dominates the institutional-

ization literature, emphasize organizational tendencies toward conformity and legitimization (Zucker, 1988). When external institutional norms encourage reliability and accountability, organizational behavior will tend to reflect inertia. By the same token, when external institutional norms encourage innovation and change, organizational behavior will tend to reflect flexibility (Zucker, 1987b).

In this article, we argue that corporate responsiveness can be best understood and predicted through examining all three types of forces— inertial, adaptive, and institutional—together. The HMO industry provided a useful context for examining inertia, flexibility, and isomorphism with respect to responsiveness to radical change. In 1983, nonprofit HMOs faced an environment that favored the for-profit form. The nonprofit advantage of the federal loan program ended, and the competitive advantages of for-profit status continued. New HMOs overwhelmingly entered the industry in the for-profit form (Wallace, 1986). To achieve a better fit with the environment's new economic and institutional characteristics, many nonprofit HMOs converted to for-profit status. Some acted faster than others. Still others have not converted. The speed with which individual nonprofit HMOs converted, relative to their industry counterparts, thus reflected the extent to which inertia, flexibility, and isomorphism were at work.

INERTIAL FORCES

As mentioned above, population ecologists claim that organizations are subject to strong inertial forces that tend to retard responsiveness to environmental shifts, especially when responses involve changing core features. This does not imply that organizations never change, but that inertia plays a key role in predicting corporate responsiveness to environmental changes (Hannan & Freeman, 1984).

Sources of Inertia

Inertial forces originate in both the internal and external environments of organizations (Hannan & Freeman, 1977). In Miller and Friesen's (1980) summary, internally based inertia stems from the following: (1) organizational myths, ideologies, and cultures tend to inculcate narrow views among employees that reinforce past behavior and cause its future amplification, (2) operating procedures and strategies are continued past their point of usefulness because they have enjoyed success in the past, (3) continuity in the direction of the developmental wishes of powerful members of the organization is more likely to be in line with the elaborate set of programs, goals, and expectations that has evolved around the organization and come to reflect these wishes, and (4) structural reorganizations and strategic reorientations may entail admissions of failure and a concomitant erosion of the political base and self-esteem of managers and employees who have a vested interest in established norms.

Externally based inertia stems from external stakeholders' expectations

regarding two key organizational competencies (Hannan & Freeman, 1984). The first of these is reliability: In a world of uncertainty, potential members, investors, and clients may value organizations' capacities to produce a given product repeatedly more than they value efficiency. The second of these is accountability: In a world pervaded by norms of procedural rationality, organizational legitimacy—or the endorsement of an organization's actors by powerful collective actors—depends on apparent conformity to these norms. Reliability and accountability require that the structures of roles, authority, and communication be highly reproducible (Hannan & Freeman, 1984). Organizations attain structural reproducibility through the internal processes described above.

As a reflection of its stated goals, profit status is a key dimension of an organization's core (Hannan & Freeman, 1984). In contrast to for-profit organizations, which seek to maximize profits, nonprofit organizations are designed primarily to provide service; the cash flow that the service generates is secondary. A shift to for-profit status is therefore a change in an organization's identity (Albert & Whetten, 1985). According to organizational inertia theory, we would therefore expect inertial forces to strongly affect how long it takes HMOs to convert. The strength of inertial forces is not a function of need to change as indicated by a changing environment, but rather a function of organizational characteristics that either promote or mitigate institutional drag (Hannan & Freeman, 1984). The remainder of this section discusses the effects of three such characteristics—age, size, and structure—on HMOs' response time.

Conditions Influencing Inertia

Organizational age. As organizations grow older, their members learn to trust and cooperate with each other to work out new routines (Stinchcombe, 1965). Once they have survived their early years, organizations are more willing to invest in existing routines than to create new ones (Nelson & Winter, 1982). As organizational habits form with age, organizations become increasingly bureaucratized, and traditional ways of doing things become entrenched (Evans & McQuillan, 1977; Inkson, Pugh, & Hickson, 1970). Change is thus more disruptive to an organization with traditional ways of conducting business than it is to an organization that is young and still in a state of flux.

In older organizations, power relationships become fixed (Pfeffer & Salancik, 1978). The tendency of managers to repeatedly hire people similar to themselves results in a homogeneous group of decision makers (Kanter, 1977). As organizations age, they develop a rich network of relationships with other powerful institutional actors in their environment and get enmeshed in resource dependence relationships, which in turn makes them less flexible (Aldrich & Auster, 1986; Singh et al., 1988). Since processes of institutionalization take time, young organizations may not have yet institutionalized organizational norms and are thus less likely to resist pressures to change. Accordingly, we propose

> *Hypothesis 1: Age increases response time: In response to
> the termination of federal assistance, old nonprofit HMOs
> will take longer to convert to for-profit status than young
> nonprofit HMOs.*

Organizational size. Large firms are more likely to be formalized and bureaucratic than small firms (Scott, 1987). Because large organizations must organize the efforts of many staff members, they develop formal policies and procedures to coordinate the work flow. These policies and procedures provide a measure of efficiency because decisions become routinized. However, increased formalization can lessen responsiveness to environmental changes (Lawrence & Dyer, 1983). Once formal policies and procedures are in place, strong effort is required to dislodge them. Organizations that are not highly formalized make decisions regularly and are less inclined to alter formal policies and procedures than are more formalized organizations. Empirical research has largely supported the relationship between size, formalization, and bureaucracy (Blau & Schoenherr, 1971).

Large firms tend to have complex structures (Scott, 1987) that can in turn constrain adaptability (Galbraith, 1973). If a myriad of details regarding the daily concerns of management consumes managers, they are less able to scan the environment and notice when it is necessary to reorganize or to change strategies. Even if the necessity for a change is apparent, managers of complex organizations may find it difficult to implement core changes because of the complex processes involved in adjusting information and resource flows (Hannan & Freeman, 1984). Because small firms are more flexible than large firms, they can adapt more quickly to changing environmental demands (Aldrich & Auster, 1986).

> *Hypothesis 2: Size increases response time: In response to
> the termination of federal assistance, large nonprofit
> HMOs will take longer to convert to for-profit status than
> small nonprofit HMOs.*

System coupling. Researchers have identified two basic types of HMO, which differ in terms of the degree of interdependence among the physicians involved and the extent to which operating and administrative constellations are coupled. The two forms are individual practice associations and prepaid group practices (Gray, 1986; Interstudy, 1984; Welch, 1987). Physicians in individual practice associations have independent private practices, often seeking both fee-for-service patients and HMO enrollees (Welch, 1987). In contrast, prepaid group practices employ physicians who are associated with each other in groups that may be physician- or HMO-controlled.

Physicians in prepaid group practices have what Thompson (1967) referred to as pooled interdependence, in that they share a pool of resources and members. Thompson argued that every organization has pooled interdependence; however, individual practice associations are not organizations in the traditional sense. Because their physicians often have fee-for-service patients as well as contractual relationships with other HMOs (Welch, 1987), they are not dependent on a given HMO in the same way employees are

usually dependent upon the organization for which they work. The contractual, nonexclusive nature of an individual practice association's relationship with its physicians effectively decouples the administration from the service providers (Welch, 1987). Although prepaid group practices do not have the high levels of interdependence found in firms in an industry like manufacturing, they are more collaborative and interdependent than individual practice associations, which necessitates a higher level of coordination (Galbraith, 1973; Thompson, 1967).

The overall tightness or looseness of coupling between different spheres within an organization influences its ability to overcome inertial forces (Perrow, 1986; Weick, 1976). Flows of information, commands, and resources are localized within a relatively simple and loosely coupled control structure. Each unit is thus relatively autonomous and can change its structure without requiring adjustment by other units outside its branch. However, in an organization with a tightly coupled structure, change in one unit requires adjustment by many more units, and the resulting chain reaction of adjustments will reduce the speed with which the organization can reorganize in response to environmental threats or opportunities (Hannan & Freeman, 1984).

Internal requirements for coordinated action and flows are associated with increased social and structural complexity; increased social and structural complexity engender patterns of interdependence among activity systems that in turn promote resistance to fundamental change (Tushman & Romanelli, 1985). Such systems have slower response times not because they are any slower than simpler, more tightly coupled systems in detecting environmental threats and opportunities, but because the process of adjustment takes longer (Hannan & Freeman, 1984).

> *Hypothesis 3: The tightness of system coupling increases response time: In response to the termination of federal assistance, nonprofit HMOs that are prepaid group practices will take longer to convert to for-profit status than nonprofit HMOs that are individual practice associations.*

ADAPTIVE FORCES

In contrast to population ecologists, who emphasize the importance of inertial forces in constraining responsiveness and transformation, rational adaptation theorists emphasize the centrality of economic forces in propelling organizational transformation. According to adaptation theorists, organizations change in order to cope with shifting opportunities and threats (Chakravarthy, 1982). This does not imply that inertial properties do not exist but that organizations can and do undergo radical transformations in response to forces that render their current positions ineffective (Tushman & Romanelli, 1985).

Proponents of the adaptation perspective have taken varied approaches to explaining the forces that propel fundamental changes. Contingency, or

"fit," theory focuses on lack of consistency between internal and external characteristics (Miller & Friesen, 1984); resource dependence theory focuses on organizational inability to control critical resources (Pfeffer & Salancik, 1978); strategy theory focuses on the gap between organizational aspirations and capabilities and environmental threats and opportunities (Andrews, 1980); and organizational learning theory focuses on the gap between organizational theories of action and environmental feedback (Argyris & Schon, 1981).

Forces That Shape Disequilibrium

According to all these approaches, the appropriate nature of change can only be decided in reference to a particular set of internal and external variables that characterize the forces that shape disequilibrium. Whether these variables encourage or impede changes, studying them answers three fundamental questions: (1) Is something wrong with the current situation? (2) Is there a need for a new position or orientation? and (3) Does the organization have the resources to change? (Ginsberg, 1988). Examples of internal variables influencing disequilibrium are the feedback effects of prior performance (Oster, 1982), aspiration levels (Cyert & March, 1963), and organizational slack (Bourgeois, 1981). Examples of external variables influencing disequilibrium include the availability of resources (environmental munificence) (Aldrich, 1979), competitors' actions (MacMillan, McCaffery, & Van Wijk, 1985), and atypical performance demands external stakeholders place on a system (Lundberg, 1984).

As mentioned earlier, all nonprofit HMOs experienced the environmental shift that resulted from changes in federal policy. According to adaptation theory, internal and external variables that shape disequilibrium should have determined the extent to which this shift created pressure to convert to for-profit status.

Conditions Influencing Disequilibrium

Organizational slack. Although organizational slack makes it easier to implement change, it lowers the motivation to undertake change (Hedberg, 1981). Organizations with slack resources are cushioned from the effects of change (Thompson, 1967). An abundance of slack resources can breed contentment and limit the range of problemistic search (Cyert & March, 1963), and excessive slack tends to dull an organization's sensitivity to environmental variances and discontinuities and to strengthen resistance to change (Starbuck & Hedberg, 1977; Thompson, 1967). By the same token, an organization's motivation to change increases with diminishing resources (Williamson, 1975).

When an organization is prepaid for the resources it offers, the level to which those resources are used has a direct effect on the organization's slack. Additional use doesn't bring additional revenue, only additional costs: As utilization increases, resources decrease. This diminishment of slack re-

sources increases vulnerability to environmental change and motivation to respond to that change.

> *Hypothesis 4a: Low utilization increases response time: In response to the termination of federal assistance, nonprofit HMOs with low utilization ratios will take more time to convert to for-profit status than nonprofit HMOs with high utilization ratios.*

All things being equal, an organization that uses its resources efficiently will generate slack (Cyert & March, 1963). These slack resources can affect both the attention the organization pays to anticipating problems and the speed with which it responds to environmental change. Meyer (1982) found that very efficient hospitals did little to anticipate or adapt to a doctors' strike. However, hospitals with small reserves and a high level of staffing anticipated the environmental jolt and responded promptly. Because HMO clients pay in advance for the service they receive, the higher the physician case load, the less slack an HMO will generate, and the less slack an organization has, the more motivated it will be to respond to changes in environmental opportunities and threats.

> *Hypothesis 4b: A high physician case load decreases response time: In response to the termination of federal assistance, nonprofit HMOs with high physician case loads will take less time to convert to for-profit status than nonprofit HMOs with low physician case loads.*

Performance demands. The likelihood that an organization will change in response to an environmental shift depends not only on the pressures that come from performance outcomes, but also on those that come from aspiration levels (Cyert & March, 1963). Such pressures may come from the aspirations of external stakeholders. For instance, HMOs that report to the federal government for accreditation face additional pressure to perform well. Atypical performance demands placed on a system by the marketplace and the public build up pressures for transformation (Lundberg, 1984).

Many analysts consider federal qualification to be the "Good Housekeeping seal of approval" of the industry (Anderson, Herold, Kohrman, & Morrison, 1985: 99). Federally qualified HMOs agree to provide a specific array of services and to make them available to all members whenever they are needed. There must be open enrollment for at least 30 days per year and premiums must be constant across members and set at the going rate in a community. Other requirements include making federal reports and providing continuing education, grievance procedures, and member involvement in policy making. Federally qualified nonprofit HMOs face stronger pressures to convert than those that are not federally qualified because they are committed to maintaining a specific range of services and therefore cannot restructure their services as easily to save costs.

> *Hypothesis 5: Federal qualification decreases response time: In response to the termination of federal assistance, federally qualified nonprofit HMOs will take less time to*

conver/to for-profit status than nonprofit HMOs that are
not federally qualified.

Competitive pressures. New entrants into a market bring new capacity,
the desire to gain market share, and often, substantial resources (Porter,
1980). This tends to result in the bidding down of prices or the inflation of
incumbents' costs, thereby reducing profitability (Spence, 1977). When en-
trants are perceived as posing a serious strategic threat, they are likely to
provoke substantial and rapid response from incumbents (MacMillan et al.,
1985).

On the basis of these arguments, we would expect the entry of new
HMOs into a market to increase competition in that market. As mentioned
earlier, new entrants into the HMO industry have overwhelmingly chosen
for-profit status (Wallace, 1986). The differential advantages these new en-
trants possess have posed a substantial threat to existing nonprofit HMOs.
We would therefore expect such entry to provide strong pressure on those
HMOs to convert.

> *Hypothesis 6: Competitive pressure decreases response*
> *time: In response to the termination of federal assistance,*
> *nonprofit HMOs in environments characterized by high*
> *HMO entry rates will take less time to convert than those*
> *in environments characterized by low HMO entry rates.*

Environmental munificence. Environmental munificence, which re-
flects the amount of slack available in an organization's environment, de-
pends on two factors: the overall availability of resources required for the
organization to survive and the extent of demand competing organizations
place on those resources (Aldrich, 1979; Starbuck, 1976). Munificence is
therefore a measure of the opportunities an environment presents to an
organization. These opportunities are a function of input availability and
market potential.

When determining whether or not to expand operations, firms must
consider both the costs of obtaining key inputs and the anticipated future
demand (Porter, 1980). Opportunities for growth are more feasible when the
key resources required for growth are plentiful. Physicians represent a key
input to HMOs because there is no substitute for their skills and the exten-
sive education they require precludes HMOs' training their own physicians
(Interstudy, 1984). We would therefore expect physician availability to in-
crease pressure on nonprofit HMOs to convert.

> *Hypothesis 7a: Physician availability decreases response*
> *time: In response to the termination of federal assistance,*
> *nonprofit HMOs in environments characterized by high*
> *physician-to-population ratios will take less time to con-*
> *vert to for-profit status than those in environments char-*
> *acterized by low physician-to-population ratios.*

Market saturation indicates the potential for future demand. If a market
is highly saturated, the benefit of obtaining the few new customers available
is unlikely to outweigh the costs of pursuing growth. We would therefore

expect HMOs in highly saturated markets to be less motivated to engage in change in response to opportunities for growth.

> *Hypothesis 7b: Market saturation increases response*
> *time: In response to the termination of federal assistance,*
> *nonprofit HMOs in environments characterized by low*
> *HMO market saturation will take less time to convert than*
> *those in environments characterized by high HMO market*
> *saturation.*

INSTITUTIONAL FORCES

In contrast to population ecologists, who stress the role of inertial forces in constraining change, and in contrast to rational adaptation theorists, who stress the role of economic forces in propelling change, institutional theorists stress the role of institutional forces in enabling change. According to institutional theorists, the extent to which change is externally legitimized rather than whether or not it is economically sound determines its value (Scott & Meyer, 1983).

Many organizational patterns, as well as the changes in those patterns, can be traced to the institutional forces that pressure organizations to conform to norms in their environment (Zucker, 1988). Organizations may conform for a number of reasons, including: (1) desire to enhance their likelihood of survival (Singh, Tucker, & House, 1986a), (2) desire to increase their external legitimacy (Meyer & Rowan, 1977), and (3) their assumption that conforming is the appropriate thing to do (Zucker, 1983). Once a form is institutionalized, it is instilled with a value that transcends its technical utility (Selznick, 1957).

Organizations have both a technical and an institutional component: some are predominantly technical (e.g., factories, transportation firms) and others are predominantly institutional (e.g., schools, mental health centers) (Scott, 1987). Although health care delivery involves highly developed technologies, the assessment of service quality remains ambiguous. Effectiveness is difficult to gauge, not only for patients, but also for government and other authorities (Marmor et al., 1987). In industries where the criteria for effectiveness are inexact, external legitimacy becomes especially salient (Singh et al., 1986a), and isomorphism becomes prevalent (Scott & Meyer, 1983).

Institutional theorists have paid great attention to the deliberate choosing of organizational forms (Scott, 1988). Because organizations exist in networks, isomorphism can arise from their interconnectedness and interaction. Within such networks, some organizations will be perceived as more capable than others. The forms these market leaders take are often held up as examples for other organizations to follow (Hinings & Greenwood, 1987). Other organizations begin to imitate the leaders' forms, even if they cannot imitate their content. DiMaggio and Powell (1983) referred to this process as mimetic isomorphism.

Isomorphism can also result from coercion (DiMaggio & Powell, 1983) or

inducement (Scott & Meyer, 1983). Changes imposed, induced, or autho-
rized by a superordinate authority are likely to meet with little resistance
and diffuse quickly. For instance, corporations routinely impose reorgani-
zations upon subordinates (Scott, 1988), and in states that have adopted
municipal reforms, cities tend to institute municipal reforms quickly (Tol-
bert & Zucker, 1983).

The HMO industry has a strong institutional component because of its
ambiguous technology. Therefore, we would expect HMOs' speed of con-
version to vary with the extent to which the conversion process is institu-
tionalized.

National HMO chains are organized as semiautonomous, geographically
diversified profit centers. HMOs that belong to a national chain must report
their growth and profits to the chain's headquarters. This multidivisional
(M-form) structure brings capital market discipline inside an organization
(Williamson, 1975). The corporate office allocates resources and exercises
control by discriminating between subunits on the basis of their perfor-
mance and their potential (Williamson, 1985). In exposing member HMOs to
the discipline of an internal capital market, corporate managers of HMO
chains are likely to pressure members into adopting the organizational form
that best fits market circumstances. In some instances, a parent company
may even exert coercion. However, even in the face of strong parental pres-
sure, conversion is an individual HMO phenomenon. State approval must be
granted before an HMO can convert, and an HMO need not have the same
profit status as its parent.

Even in the absence of a particular parental preference, chain members
are likely to adopt the environmentally preferred form because of the high
performance demands corporate parents are likely to impose on individual
HMOs. Together, performance pressures imposed by headquarters and cor-
porate power to induce change reflect institutional pressures that will in-
crease the responsiveness of chain members. For these reasons, we would
expect members of HMO chains to face stronger pressures to convert to
for-profit status than independent HMOs and to convert more quickly.

> *Hypothesis 8a: Membership in a chain decreases re-*
> *sponse time: In response to the termination of federal as-*
> *sistance, nonprofit HMOs that are members of chains will*
> *take less time to convert to for-profit status than indepen-*
> *dent, nonprofit HMOs.*

Some regulators, boards of directors, and physicians believe that for-
profit status is at odds with the human service aspect of health care. Physi-
cians sometimes fear that profit-oriented managers will obtain control to the
detriment of patients (Meyer, 1988). Or they may be concerned that for-profit
operation will rob them of their professional autonomy (Marmor et al., 1987).
Board members sometimes resist for-profit status because they feel that prof-
its are inappropriate and earnings should be reinvested to improve services
(Graham, 1986).

However, as the proportion of for-profit HMOs increases, so does their

acceptance by the industry and the public. In an environment where cost containment is valued, for-profit HMOs may even achieve their own form of legitimacy. DiMaggio (1987) noted that, in some environments, nonprofit organizations adopt multidivisional structures and cost containment programs to signal that they are good businesses. Empirical research has also shown that the existence of for-profit providers in a health care market exerts pressure on nonprofit providers to behave more like for-profit entities (Marmor et al., 1987). Therefore, we would expect for-profit status to become more acceptable as the number of for-profit HMOs in a market increases.

> Hypothesis 8b: The presence of for-profit HMOs in a state
> decreases response time: In response to the termination of
> federal assistance, nonprofit HMOs in states that have a
> high percentage of for-profit HMOs will take less time to
> convert to for-profit status than nonprofit HMOs in states
> that have a low percentage of for-profit HMOs.

Policies and procedures that guide an organization's activities (e.g., standard operating procedures, state regulations) often reflect normative pressures (Zucker, 1988). The adoption of these legitimated elements leads to isomorphism with an environment (Zucker, 1988). States are primary sources of such normative pressures (DiMaggio & Powell, 1983). State authorities can create pressure for change through inducements or coercion (Scott, 1988). However, a state need only signal its support for a change to increase institutionalization of that change; wherever possible, agents for change will seek state support (Scott, 1988). Pressure on an organization to change will increase with such support.

State regulations have a major impact on the process of conversion (Houck & Mueller, 1986). Some states have made conversion more difficult by rigorously scrutinizing conversion requests (Graham, 1986). Others have statutory provisions that explicitly allow a nonprofit HMO to become a for-profit business corporation (Dunn et al., 1986). A statute favoring conversion is not a prerequisite; many HMO conversions have occurred in states without such a statute. However, the existence of a state statute is an indication that a process has become institutionalized (Zucker, 1987a). We would therefore expect isomorphic pressures on nonprofit HMOs to convert to be stronger in states with statutes that favor conversion.

> Hypothesis 8c: Supportive state legislation decreases re-
> sponse time: In response to the termination of federal as-
> sistance, nonprofit HMOs in states that have specific stat-
> utes permitting conversion of nonprofit organizations to
> for-profit status will take less time to convert to for-profit
> status than nonprofit HMOs in states that do not.

To summarize, we have identified three kinds of forces that are woven into the fabric of organizational behavior. We have proposed that, together, these forces determine corporate responsiveness to radical change. Inertial forces emphasize tendencies toward containment and norms of reliability and bureaucracy, adaptive forces emphasize tendencies toward induce-

ment and economic considerations, and institutional forces emphasize ten-
dencies toward isomorphism and institutional pressures on conformity and
legitimization. This assertion leads to two expectations: All these forces will
influence the time it takes an HMO to convert in response to the termination
of federal assistance, and the confluence of all three types of forces best
predicts the amount of time before conversion.

METHODS

Data Collection

Most of the data were drawn from a series of censuses conducted by
Interstudy, a nonprofit research and consulting organization located in Ex-
celsior, Minnesota, just outside of Minneapolis. In 1981, the federal govern-
ment gave Interstudy the responsibility for conducting a census of HMOs.
Since then, Interstudy has been the official source of information about the
HMO industry and has become a nationally prominent, nonpartisan advo-
cate of health care reform. Interstudy conducts surveys with a mailed ques-
tionnaire. HMOs that do not return the form are contacted by Interstudy staff
members, who then conduct a phone survey (Interstudy, 1983). In addition,
we drew data on physician availability from the United States Bureau of the
Census and data on supportive state legislation from Dunn and colleagues
(1986).

The population studied included all nonprofit HMOs in the United
States that existed in both June 1983 and June 1987, with the exception of
one HMO that we omitted from the data set because it was an outlier for age
(it was 132 years old, 86 years older than the second-oldest HMO). Except in
the data on a few large HMOs, Interstudy did not report profit status prior to
1985. Therefore, we could only use Interstudy data to identify HMOs that
converted from nonprofit to for-profit status after that year. To identify
HMOs that had converted before 1985, we conducted a telephone survey of
HMOs that were listed as for-profit in June 1985 to determine if they had ever
been nonprofit and, if so, when they had converted. Out of 91 HMOs con-
tacted, 86 (95%) agreed to answer our questions. This brought the number of
HMOs for which we had data to 167, out of which we identified 46 as having
undergone conversion.

To explore whether converted HMOs would be likely to be dispropor-
tionately represented among the nonsurvivors, we tracked our study group
from June 1987 to January 1989 to determine which HMOs had terminated
their operations. There was no significant difference between the proportion
of nonprofit HMOs that had failed and the proportion of converted HMOs
that had failed. Eight nonprofit and one converted HMO had terminated
operations; the standard error of the difference between the proportions was
.039. A limitation of this check is the assumption that the survival of con-
verted HMOs in our study group mirrors that of those excluded from our
group. A strength of this check is that we could better isolate the effects of

conversion when looking at a group that had all survived the liability of newness: In June 1987, all the HMOs studied were at least four years old.

Measurement

The analyses performed included 12 independent variables: age, size, structure, utilization, case load, federal qualification, physician availability, market saturation, entry rate, chain membership, for-profit HMOs, and state law. The first, second, and third variables are independent variables measuring inertial forces, the fourth through the ninth are independent variables measuring adaptive forces, and the last three are independent variables measuring institutional forces. We calculated values for the independent variables for 1983, when the federal government announced the end of its loan program for nonprofit HMOs.

Both the task environment (physician availability, market saturation, and entry rate) and institutional environment variables (for-profit HMOs and state law) were measured at the state level. Unlike hospitals, HMOs do not necessarily confine their operations to one community or metropolitan area. Therefore, this study employed the Interstudy method of assessment, which is to assign each HMO to the state in which its headquarters are located. Since an HMO must be licensed by the state it serves, most HMOs have headquarters in their service area. However, Interstudy individually contacts each HMO to ascertain that its service area is actually in the same state as its headquarters. In the rare instance in which they differ, Interstudy lists the HMO as having headquarters in the area it actually serves.

Age, the number of years in operation, was taken directly from the Interstudy census. Size was measured by the logarithm of the number of members enrolled in an HMO. This measure of size has been commonly used in studies of HMOs (Schlesinger, Marmor, & Smithey, 1983) and is reported in each Interstudy census. We used the logarithm of size because, unlike other variables in our study, such as age, size was expected to have a marginally decreasing effect. Logarithmic conversion was consistent with previous research practice (e.g., Dewar & Dutton, 1986; Kimberly & Evanisko, 1981).

Structure was measured as a dichotomous variable. Interstudy divides HMOs into two types, each reflecting a different level of system coupling: individual practice associations, which are organized around solo and single-specialty practices, and prepaid group plans, which are not so organized and fall into three subtypes: staff plans, which directly employ one physician group; group plans, which have one independent physician group; and network plans, which contract with two or more independent groups and may also have a staff group (Gray, 1986; Interstudy, 1987). We coded individual practice associations as having a low level of system coupling, using 0, and prepaid group plans as having a high level of system coupling (1).

Utilization, the ratio between the number of days of service rendered by an HMO and its number of members, measured the extent to which members used available services. Case load, the ratio between the number of members

enrolled in an HMO and its number of physicians, measured the efficiency with which an HMO used its physicians. Federal qualification was a dichotomous variable, with 1 signifying federal qualification and 0 signifying no federal qualification. Physician availability was the number of physicians in a state per 100,000 residents. Market saturation was the ratio of HMO enrollees in a state to the total state population. Entry rate was the ratio of the number of HMOs entering a state market to the number of HMOs existing in that market.

Chain membership was a dichotomous variable with 1 signifying membership in a national chain and 0 signifying no membership. National chains operate HMOs in two or more states. For-profit status was the ratio of the number of for-profit HMOs to the total number of HMOs in a state. State law was a dichotomous variable, with 1 referring to location in a state having statutes specifically permitting conversion and 0 referring to location in a state without such statutes.

The dependent variable, conversion time, was operationally defined as the logarithm of the time that had elapsed between the cessation of the federal loan program in 1983 and an HMO's conversion. We measured conversion time in six-month intervals, with the last ending in June 1987. The period measured ends prior to the October 1987 stock market crash and thereby covers a time in which the financial environment was relatively constant. Data from organizations that had not converted by June 1987 were right-censored.

Data Analysis

Survival analysis methodologies provide a dynamic analysis of organizational change and are particularly appropriate for examining a process that occurs over time (Tuma & Hannan, 1984). This study used accelerated event-time analysis, a survival analysis technique that can be accessed through the program SAS PROC LIFEREG. In accelerated event-time analysis, the dependent variable is the time until an event occurs—in this study, the time to conversion. The event-time method estimates the effects of independent variables on the time to conversion. A key advantage of event-time analysis is its incorporation of right-censored data (Mitchell, 1989). Data are right-censored when the data collection ends before some observations have experienced the event. In this study, 72 percent of the HMOs had not converted when the data collection ended and might or might not have done so subsequently.

With the accelerated event-time method, an event-time distribution must be specified because the procedure rests on the assumption that the baseline distribution would hold if the value of all the explanatory variables were zero (Cox & Oakes, 1984; Kalbfleisch & Prentice, 1980; Mitchell, 1989). A positive coefficient accelerates the baseline and a negative coefficient decelerates it (Mitchell, 1989). We used the following model:

$$y = a + XB + \sigma\epsilon,$$

where

    y = the logarithm of conversion time,
    X = the covariate matrix,
    B = regression parameters,
    σ = the scale parameter,

and

    ϵ = the errors vector.

If an underlying rate of conversion begins at a low value, then rises, and then declines again, a lognormal distribution best models the data (Cox & Oakes, 1984; Levinthal & Fichman, 1988; Mitchell, 1989). The empirical conversion-time plot followed such a nonmonotonic, inverted U-shaped pattern. To determine if the underlying distribution matched the empirical form, we compared the lognormal and the Weibull distributions[1] by testing the absolute difference of their loglikelihoods multiplied by two, a difference having an approximate chi-square distribution (Kalbfleisch & Prentice, 1980; Levinthal & Fichman, 1988). The lognormal distribution yielded a better fit than the Weibull distribution (χ^2 = 3.34, p < .10); the qualitative results remained the same. As a result, we chose the lognormal distribution for the model. We computed the logarithm of the dependent variable in keeping with standard practice; however, an analysis run without converting the dependent variable to a logarithm yielded the same pattern of results, albeit with stronger effects.

In spite of its strengths, accelerated event-time analysis is subject to the weaknesses common to all techniques used in nonexperimental design. The absence of an experimental design precludes establishing cause-effect relationships unequivocally (Carroll, 1984; Singh, Tucker, & Meinhard, 1986b).

RESULTS

Tables 1 and 2 show descriptive statistics for the independent variables. Table 1 presents means, standard deviations, and intercorrelations. Although a number of variables are significantly correlated, correlation magnitudes do not indicate any cause for concern about multicollinearity. Table 2 compares the means and standard deviations of the independent variables for HMOs that converted and the statistics for those that did not.

Table 3 shows the results of accelerated failure time analyses for the inertial, adaptive, institutional, and integrated models. The results for the inertial model, which show that the time to conversion increases with age and with the tightness of system coupling, support the first and third hypotheses. However, they do not support the second hypothesis—size does not significantly influence response time.

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[1] The Weibull distribution is a two-parameter distribution that allows for a monotonic relationship between time and the event's occurrence.

TABLE 1
Means, Standard Deviations, and Intercorrelations for Independent Variables[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Age	7.18	8.86											
2. Size	9.82	1.32	.58										
3. Structure	0.62	0.48	.23	.20									
4. Utilization	0.04	0.05	-.11	-.57	-.10								
5. Case load	307.46	369.31	.11	.29	.46	-.25							
6. Federal qualification	0.59	0.49	.03	.22	.05	-.18	.30						
7. Rate of entry	0.12	0.20	.10	.00	.08	.00	.02	-.13					
8. Market saturation	8.98	7.58	.32	.24	.02	-.08	-.05	.18	-.29				
9. Physician availability	214.45	78.62	.15	.10	.03	-.04	.03	.20	-.24	.40			
10. Chain membership	0.19	0.39	.10	.20	.09	.11	.03	.12	-.01	.01	.11		
11. For-profit HMOs	0.31	0.19	-.11	-.04	-.03	-.05	.05	.08	-.00	-.30	.03	-.01	
12. State law	0.22	0.41	.02	.01	-.10	.05	-.10	.06	-.16	.54	-.07	-.06	-.01

[a] $N = 167$. Coefficients greater than .14 are significant at $p < .05$.

TABLE 2
Mean Values of the Independent Variables for Each Response

Variables	Response[a]		t
	No Conversion	Conversion	
1. Age	8.35 (9.91)	4.11 (3.85)	3.98***
2. Size	9.96 (1.37)	9.46 (1.13)	2.22*
3. Structure	0.68 (0.47)	0.48 (0.51)	2.40*
4. Utilization	0.03 (0.04)	0.05 (0.07)	−1.45
5. Case load	337.62 (381.11)	228.12 (326.98)	1.72†
6. Federal qualification	0.55 (0.50)	0.70 (0.47)	−1.77†
7. Rate of entry	0.12 (0.25)	0.13 (0.33)	−0.21
8. Market saturation	9.32 (7.63)	8.07 (7.46)	0.95
9. Physician availability	221.42 (82.22)	196.11 (65.57)	1.87†
10. Chain membership	0.13 (0.34)	0.33 (0.47)	−2.54**
11. For-profit HMOs	0.30 (0.19)	0.36 (0.20)	−1.72†
12. State law	0.16 (0.37)	0.37 (0.49)	−2.68**

[a] Figures in parentheses are standard deviations. There were 121 HMOs in the no-conversion group and 46 in the conversion group.

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

The results for the adaptive model are also mixed: utilization does not significantly influence response time. However, time to conversion increases with case load, thereby supporting Hypothesis 4b. The effects of federal qualification are significant and consistent with the hypotheses regarding performance demands. HMOs in markets with low saturation take significantly less time to convert than those in markets with high saturation, thereby supporting Hypothesis 7b. However, results do not support Hypothesis 7a—physician availability does not significantly influence time to conversion.

The three variables in the institutional model have a significant effect on HMO response time that is consistent with Hypotheses 8a, 8b, and 8c. Time to conversion increases with chain membership and decreases with the percentage of for-profit HMOs in a state. And HMOs in states with supportive state legislation take significantly less time to convert.

The loglikelihoods for each of the models were strongly significant: each model contributed significantly more than a model containing only an intercept. The chi-square statistic for improvement over the no-covariate likelihood (−119.60) was 15.02 ($df = 3$, $p < .001$) for the inertial model, 17.62 ($df = 6$, $p < .01$) for the adaptive model, 21.66 ($df = 3$, $p < .001$) for the institutional model, and 62.72 ($df = 12$, $p < .001$) for the integrated model.

The likelihood ratio statistic for each model assesses the fit to the data. Under the null hypothesis that a model fits data, a log likelihood has an approximate chi-square distribution with the probability (p) that a higher chi-square value will be obtained, if the model fits. Therefore, the higher the

TABLE 3
Accelerated Event-Time Models Predicting HMO Responsiveness[a]

Explanatory Variables	Model 1: Inertial		Model 2: Adaptive		Model 3: Institutional		Model 4: Integrated	
	Maximum Likelihood Estimate	Standard Error	Maximum Likelihood Estimate	Standard Error	Maximum Likelihood Estimate	Standard Error	Maximum Likelihood Estimate	Standard Error
Intercept	2.712**	0.866	2.189***	0.366	3.332***	0.251	3.810**	1.187
Age	0.047*	0.024					0.055*	0.025
Size	-0.052	0.096					-0.160	0.119
Structure	0.409*	0.186					0.354†	0.188
Utilization			-1.375	1.830			-0.933	1.972
Case load			0.001**	0.000			0.001*	0.000
Federal qualification			-0.636**	0.216			-0.641*	0.214
Rate of entry			-0.013	0.320			0.010	0.284
Market saturation			0.012	0.014			0.082**	0.027
Physician availability			0.003†	0.002			0.001	0.001
Chain membership					-0.637**	-0.213**	-0.653**	0.202
For-profit HMOs					-0.985*	0.471	-0.665	0.464
State law					-0.664***	0.205	-1.571***	0.381
Scale value	0.898	0.109	0.899	0.109	0.872	0.105	0.729	0.086
Log likelihood	-112.088		-110.79		-108.77		-88.24	
χ^2	224.18		221.58		217.54		176.48	
df	164		161		164		155	
p	.001		.000		.005		.113	

[a] Noncensored values came from data on the 46 HMOs that converted, and censored values came from data on the 121 HMOs that did not convert.

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

value of p, the better the fit of the model. A probability greater than .05 is generally considered adequate. As shown in Table 3, only the integrated model provides a good fit ($\chi^2_{155} = 176.48$, $p < .113$).[2]

The results the integrated model provide suggest that (1) young HMOs take less time to convert than old organizations, (2) HMOs with loosely coupled systems take less time to convert than those with tightly coupled systems, (3) HMOs with low physician case load ratios take less time to convert than HMOs with high physician case load ratios, (4) HMOs that are federally qualified take less time to convert than HMOs that are not, (5) HMOs in moderately saturated markets take less time to convert than HMOs in highly saturated markets, (6) HMOs that are members of national chains take less time to convert than HMOs that are not, and (7) HMOs in states with laws that enable conversion take less time to convert than HMOs in states without such laws.

DISCUSSION

Major approaches to the study of organizational transformation have tended to emphasize mutually exclusive assumptions and research focuses (Hrebiniak & Joyce, 1985). The tendency to take inertial forces for granted has led population ecologists to ignore the processes by which individual firms adapt to fundamental environmental shifts and to concentrate instead on the study of the birth rates and death rates of structural forms. The tendency to take inductive forces for granted has led rational adaptation theorists to ignore the institutional circumstances that impede rational responses and to concentrate instead on the study of organization-environment alignments and their performance outcomes. Finally, the tendency to stress institutional pressures has led institutional theorists to ignore the economic circumstances that cause organizational actors to act rationally and to concentrate instead on studying the sources and consequences of institutional practices and arrangements.

Relative Versus Absolute Inertia

More recently, organizational theorists have begun to challenge the extremeness of these positions, arguing that inertial and inductive tendencies dominate under different circumstances. Empirical research has begun to follow suit by examining conditions that influence the occurrence of change. For example, Singh and his colleagues (1988) examined the relationship between organizational age and size and the occurrence of core changes among voluntary organizations; Kelly and Amburgey (1989) examined the

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[2] Although the correlation matrix does not point to a clear-cut case of multicollinearity between size and age, organizations are generally expected to get bigger as they get older, and age and size have a fairly high positive correlation here. We therefore also analyzed two other versions of the integrated model, one without size and one without age. Removing age did not result in significance for size, indicating that age was not shielding the effect of size.

relationship between organizational age and size and the occurrence of core changes among firms in the airline industry; Zajac and Shortell (1989) examined the relationship between prior strategic orientation and the occurrence of reorientation among hospitals in response to an environmental shift; and Fombrun and Ginsberg (1990) examined the effects of inertial and inductive forces on the propensity to change corporate posture among firms in ten industry sectors. Such studies, however, have been limited in an important way: they have examined absolute rather than relative concepts of inertia or flexibility. In contrast, this study examined the speed with which organizational transformation occurred in response to a major environmental shift: When the federal government withdrew its loan support, the pressure on nonprofit HMOs to convert to for-profit status became compelling (Houck & Mueller, 1986). Rather than examining absolute inertia or flexibility by asking if an HMO converted or not, this study explored responsiveness to radical change by asking how quickly the HMO responded to the shift.

The results of this study support the importance of an organization's age and structure in influencing inertial forces. The support found for the first hypothesis is particularly interesting in light of alternative arguments and findings that older organizations are more experienced with environmental changes and may therefore be more likely to adapt to the demands of a changing environment (Carroll, 1983). A study of semiconductor firms by Boeker (1989) showed that the difference between initial strategy and current strategy increased significantly with age; a study by Kelly and Amburgey (1989) showed that old airlines were less likely than young airlines to experience core changes, but not significantly so; and a study of voluntary social service organizations (Singh et al., 1988) showed that rates of change increased significantly with age. The results of our study indicate that age may affect *relative* inertia and *absolute* inertia differently—the rate of occurrence of core change may increase with organizational age, but the response time preceding core change may diminish as organizations age. An old HMO has had time for its nonprofit identity to become firmly entrenched, so although it may be as likely to convert as a young HMO, the process may take longer.

The Effect of Size

Although the results do not support the contention that inertia increases monotonically with size, the study may also not provide evidence to the contrary. Empirical results related to size have often contradicted each other. For example, Singh and colleagues (1988) and Kelley and Amburgey (1989) found a positive relationship between size and the occurrence of change. This coupling may occur because size can represent other dimensions, such as amount of slack resources (Nord & Tucker, 1987). In the HMO industry, large nonprofit HMOs have a greater debt capacity and are somewhat cushioned from the nonprofit form's low access to capital (Birnbaum, 1987).

Alternatively, we cannot rule out the possibility that many large organizations have more managerial and financial resources with which to monitor

their environment and implement changes. This could enhance larger organizations' responsiveness and counteract the inertial effects of increased size. Lastly, Hannan and Freeman (1984) pointed out that the threshold size above which failure to delegate authority limits responsiveness may vary by organizational form and also by age.

Confluence of Forces

The results of this study suggest that a confluence of internal and external variables that motivate change influences corporate responsiveness. Whether the pressure to convert came from resource demands, external markets, corporate headquarters, or the federal government, HMOs under high pressure to perform took significantly less time to convert to for-profit status than did others. Secondly, depending on the context, some variables may be more relevant than others in shaping disequilibrium. For example, the present results suggest that market saturation may be more relevant than resource availability or the entry rate of competitors in predicting response time. Together, these findings support the view that the appropriateness of a change can only be decided in reference to a particular set of internal and external variables characterizing the forces shaping strategy change (Ginsberg, 1988; Tushman & Romanelli, 1985).

The results also support the contention that both economic and institutional forces influence responsiveness. A model including both economic and institutional pressures and constraints best predicted the speed with which nonprofit HMOs converted to for-profit status in response to the termination of federal assistance. HMOs in moderately saturated markets and in states with statutes enabling conversion took less time to convert. This suggests that not only economic and performance-related imperatives influence managers judging the soundness of undergoing a major change in response to a radical environmental shift; ideas about the extent to which such a change will appear reasonable and rational may also influence managers.

To summarize, the findings of this study support an integrative approach to the study of corporate responsiveness and transformation, for only the integrated model provided a good fit to the data. This fact points to the complementarity of different schools of thought regarding the importance of different forces. A dramatic change in federal policies toward HMOs in 1983 shifted resource flows and removed key advantages of nonprofit status. Compared to those that converted quickly, nonprofit HMOs that have not converted or have been slow to convert appear to have been under weaker economic and institutional pressures to respond to the environmental shift and stronger inertial constraints to maintain the status quo.

The robustness of the integrated model also indicates the holistic nature of organizational behavior: Inertial and adaptive forces not only determine each other's impact on corporate responsiveness, but are also often closely related. For example, as organizations age, they not only become more encased in past behaviors—they also tend to become better performers and often, models for other organizations. Thus, they may also have weaker

economic and institutional incentives to change than young organizations have. The HMO industry is a case in point: In 1986, 56 percent of the plans more than three years old were profitable, while only 14 percent of those less than three years old were profitable (Larkin, 1988). Old staff- and group-model plans, which have years of experience and established procedures and cost controls, are in a better position to operate profitably than young plans. In contrast, many small independent practice associations have not developed the critical mass to support costs and shifts; the administrative and marketing costs of newly established HMOs are significantly higher than those of older plans (Henderson, 1988).

Managerial Implications

The integrative nature of organizational responsiveness poses a paradoxical challenge to managers. On the one hand, they are charged with maintaining organizational efficiency and internal stability; on the other hand, they must be able to change quickly when external pressures pose new threats or opportunities. Managers who have succeeded in making their organizations efficient allocators of resources may also make them more inert and ill-prepared for radical environmental shifts. For example, HMOs that used their physicians more efficiently than others were slower to convert. To the extent that this study highlights the importance of balancing competing demands, it also supports the recent arguments of a number of authors that effective leadership requires simultaneous mastery of seemingly contradictory or paradoxical capabilities (Bourgeois & Eisenhardt, 1988; Cameron, 1986).

Managers who are successful in making their organizations responsive to new environmental challenges will not ensure survival if they ignore their responsibility to maintain efficient performance in the face of competitive pressures. Analysts have been quick to point out that increased enrollment has not been the answer to achieving profitability for HMOs, especially when overutilization has severely lowered profit margins. Instead, analysts have suggested that strong management, increased premiums, and tight controls on costs and disbursements are key to HMO profitability (Henderson, 1989). In short, HMOs are finding that they have to become more business-oriented if they want to survive (Larkin, 1988).

Converting in response to a dramatic shift in federal policies is adaptive only in the sense that it has enabled HMOs to develop strategic advantages they would otherwise not have been able to develop. However, conversion to for-profit status is not adaptive in the sense that it is sufficient to ensure survival in the absence of appropriate strategic actions. Anecdotal evidence regarding the performance of HMOs that have converted to for-profit status supports this statement. In our study group, the rate of survival as of 1987 for HMOs that converted was not significantly better than it was for those that did not. Many HMOs have kept their rates and copayments artificially low because of the intensity of market competition (DiBlase, 1989). Such behavior has contributed to the one failure to date among the HMOs we studied

that changed profit status. By converting to for-profit status, HMO of Louisiana was able to continue its growth in enrollment, but it was later dissolved because it could not stem the tide of spiraling expenses and low profits caused by low prices and overutilization (Womack, 1988). In contrast, the president of Prime Health, another HMO that converted to for-profit status, maintained that his organization would not have survived without conversion. He described its conversion as extremely successful because, by making employee ownership possible through preferred stock options, it led to increased productivity. The head of another HMO also identified employee incentives as a key benefit of conversion. Having spent many years in a large nonprofit HMO and finding no opportunity there, he was convinced of the centrality of equity incentives in stimulating management productivity and effective competition.

Conversion to for-profit status appears to have benefited many HMOs despite subsequent events that made it difficult to carry out some of the goals of becoming a for-profit entity. For example, Physicians Health Services, which converted to for-profit status to help the company attract investments from physicians, has blossomed into Connecticut's largest and strongest HMO. Yet its physicians have shown little enthusiasm for investing in the company since it converted. Equity growth has not kept pace with sales volume, in part because it has not been easy to get physicians to think of themselves as shareholders and in part because of the HMO board's decision to keep margins tight and prices competitive (*Modern Healthcare*, 1989). Rutgers Community Health Plan (RCHP) was converted in the hopes of keeping it independent. But when the October 1987 stock market crash occurred shortly after its conversion, issuing stock no longer seemed a viable option. Although RCHP did not remain independent, its former president believed at the time that conversion was absolutely necessary for growth and survival since the organization had exhausted its debt capacity. In retrospect, he maintains that conversion was adaptive because it permitted RCHP to ride out a turbulent period and enabled it to accept an acquisition offer sounder than one it would have otherwise been forced to take.

Limitations and Future Directions

Some important caveats arise concerning the conclusions of our study and their implications for future research. Adaptation is a complex concept that has been defined in a number of ways (Chakravarthy, 1982; Singh et al., 1986b). In this study, we defined adaptation in process rather than outcome terms. Although most studies defining adaptation in process terms have attempted to demonstrate intentional adaptation, this study took the view that the process of adaptation, like the content of adaptation, is not necessarily intentional; it may be emergent and realized despite, or in the absence of, managerial intentions (Mintzberg, 1978). Nevertheless, to the extent possible, future studies of corporate responsiveness should attempt to determine the specific purpose of the change studied and how it might affect responsiveness. For example, HMOs that converted to gain capital and re-

main independent might have converted more quickly than those that con-
verted primarily to develop equity incentives for productivity.

The results of this study need to be extended to other types of contexts
and environmental shifts. For example, organizational populations that have
ambiguous goals and technologies and tend to be more strongly influenced
by institutional forces, such as voluntary social service organizations, may
tend to be less inclined to change than technical organizations (Meyer &
Scott, 1983; Singh et al., 1988). Secondly, this study employed a concept of
inertia and flexibility that is relevant to a particular environmental change.
Future studies should compare responsiveness to different types of environ-
mental shifts by the same set of firms or responsiveness to the same types of
environmental shifts by firms in different industries. For example, studies of
conversions among other human service providers would provide a useful
check of the generalizability of results found in the context of the HMO
industry.

Although it is clearly impractical to test for all possible combinations of
factors influencing responsiveness and change, researchers should at least
include relevant variables that adequately represent both inertial and induc-
tive forces (Ginsberg, 1988). Future research could improve upon this study
by specifying a broader range of internal and external variables influencing
inertia and flexibility.

Finally, this study focused on conversion from nonprofit to for-profit
status, which is clearly a change in core organizational properties. As Han-
nan and Freeman (1984) argued, inertial forces affecting core aspects of
organizations tend to be stronger than those affecting peripheral features.
Organizational changes that are peripheral are likely to lead to different
patterns of inertia than those seen here (Singh et al., 1988). Future research
comparing models of responsiveness involving peripheral changes with
those involving core changes is needed. By following such a direction, re-
searchers may develop more integrative and robust models of organizational
transformation than those presently available.

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AN EXPLORATORY STUDY OF CONFLICT AND COORDINATION IN INTERORGANIZATIONAL SERVICE DELIVERY SYSTEMS

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This study examined conflict and coordination in interorganizational service delivery systems. I developed hypotheses relating service and client characteristics to the amount and type of coordination a system used and relating structural variables to the levels of conflict being experienced. Empirical data from 15 interorganizational service delivery systems in two states found evidence supporting four of the five hypotheses. Conflict and coordination had a curvilinear association in these systems, a relationship that was intensified when an interorganizational system was differentiated by function and service mix. In systems that had a dominant core agency, however, it appeared that task integration among workers reduced the level of conflict.

Conflict and cooperation in interorganizational service delivery systems is a timely topic because a number of recent events have stimulated and speeded the development of interorganizational systems in U.S. communities. Reduced funding for human services has produced incentives for collaboration at the same time that community expectations regarding the potential of human services have increased (Carroll, 1985; Sosin, 1985). The result is new demand for high quality services in environments with limited resources. Service delivery systems that share resources rather than single organizations have often occupied these new niches. These systems are clusters of diverse organizations, funded by multiple sources, linked together in decision-making and working relationships and serving specialized client populations (Mulford & Rogers, 1982). Some of these client populations are newly identified ones (victims of rape and domestic violence); some have been served for many years (abusive and neglectful parents, pregnant adolescents); some have only recently become the responsibility of local communities (the chronically mentally ill); and some are recipients of service because of new medical or social interventions (hospice patients).

For many years, the least preferred strategy for organizational survival was one that required agencies to surrender autonomy (Benson, 1975; Pfeffer & Salancik, 1978). This is no longer the case. Today many agencies recognize

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that interorganizational systems are a means by which organizations can assure a steady flow of resources (Kramer & Grossman, 1987) and enhance their chances of survival (Astley & Fombrun, 1983; Wiewel & Hunter, 1985). Further, once within a service delivery system, organizations become party to symbiotic relationships marked by concerted action, reduced competition (Warren, Rose, & Bergunder, 1974), and boundary defense (Potuchek, 1986).

Some theorists have explained organizational relationships by focusing primarily on conflict (Hall, Clark, Giordinano, Johnson, & Roekel, 1977), and others have stressed cooperation (Aiken, Dewar, DiTomaso, Hage, & Zeitz, 1975). Recently, however, DiStefano (1984) hypothesized that both conflict and cooperation are necessary for the development of interorganizational structures over time. According to this view, the predominance of conflict over coordination, or vice versa, depends on the developmental stage a system is in. In fact, because the domain and jurisdictional problems created when organizations work together are so great, if either conflict or cooperation is absent from the collective experience, a system is unlikely to have the capacity to develop effective operations (Coser, 1956; Pondy, 1967, 1969; Simmel, 1968).

This article presents empirical evidence that interorganizational development requires both of these processes and argues that both conflict and cooperation are system-integrative—depending on their intensity and a system's developmental stage. Described is an empirical exploratory study of 15 community-based interorganizational service delivery systems having from 5 to 17 member organizations. The findings indicate that conflict is associated with structural characteristics of these interorganizational systems and that coordination is related to service characteristics. Excessive conflict occurred in systems in which there was a mismatch between the need for coordination and the actual amount of coordination occurring.

THEORY DEVELOPMENT

There have been many theoretical approaches to studying interorganizational relationships (cf. Morrissey, Hall, & Lindsey, 1982; Mulford & Rogers, 1982; Whetten, 1981). Theoreticians have referred to organizational sets (Evan, 1966), organizational populations (Carroll, 1985; Hannan & Freeman, 1977), interorganizational fields (Warren, 1967), and interorganizational systems (Hall et al., 1977). The developers of all these approaches have conceptualized patterns of interaction between organizations as separate from, yet part of, an environment external to the organizations themselves. It is these patterned exchanges of resources such as money, clients, information, technology, time, and energy that form the boundaries between systems (Aldrich, 1971).

In the open systems approach, service delivery systems are defined as a collective of organizations able to control an immediate field of resources and to accomplish common goals (Van de Ven & Ferry, 1980). In addition, interorganizational systems are seen as forming joint production systems

(Morrissey, Tausig, & Lindsey, 1986). As such, they adopt common operational procedures, adjust member activities to be compatible with these methods, and assign differential roles, responsibilities, and tasks (Schopler, 1987). There are, therefore, joint outputs that may be quite different from the initial preferred outputs of the participating agencies (Mulford, 1984).

The study presented here defined interorganizational service delivery systems as mandated or voluntary collectives of diverse organizations having (1) a collective goal or goals, (2) such common inputs as clients, service paradigms, and information, (3) mutually agreed-upon throughputs, including divisions of roles and tasks and compatible technologies, and (4) shared outcomes, such as a community problem adequately managed (Van de Ven & Ferry, 1980). A further assumption here was that their environment greatly influences individual organizations acting together to produce a service. Government and private funding sources create niches in which clients with specialized needs can be served, and it is the characteristics of these specialized client populations and the programs they need that determine the structure and processes of interorganizational service delivery systems (Lefton, 1970). Clients, therefore, are the chief raw material of service delivery systems, and client pathways are the primary means of locating boundaries and defining interorganizational systems.

For example, one typical interorganizational service delivery system is the juvenile justice system found in most medium-sized to large communities today. The service population is narrow—13- to 18-year-old boys and girls accused of crimes as juveniles or adults. Communities mandate two goals for these service delivery systems. First, decision makers expect, or at least hope, that interorganizational systems will achieve behavioral change in their clients. This mandate for rehabilitation requires that resources be invested in integrative activities performed by coordinating councils, multidisciplinary diagnostic teams, and case management projects. Second, decision makers expect, or at least hope, that the systems will protect life and property. This goal requires a complex mix of public and private organizations that provide a wide range of services, such as detention, probation, substance abuse treatment, family therapy, special education, and corrections. In addition, accountability requires clear delineations among participating organizations concerning functions and roles: police departments and schools do referral, juvenile courts do assessment, and probation and private agencies do treatment and monitoring. Figure 1 depicts client flow, functional specialization, and service mix in a typical community-based, interorganizational juvenile justice system.

Generally, the performance demands of juvenile justice systems are explicit. Because their clients are viewed as having multiple problems (Provan, 1984), juvenile justice systems must provide fairly comprehensive and coordinated services. Because juvenile delinquents are perceived as a risk to public safety, state laws mandate an interorganizational structure that is centralized, with all clients flowing through courts and formalized and standardized divisions of labor among agencies (Hall et al., 1977).

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FIGURE 1
Diagraph of Client Flow Through a Community-based
Interorganizational Juvenile Justice System
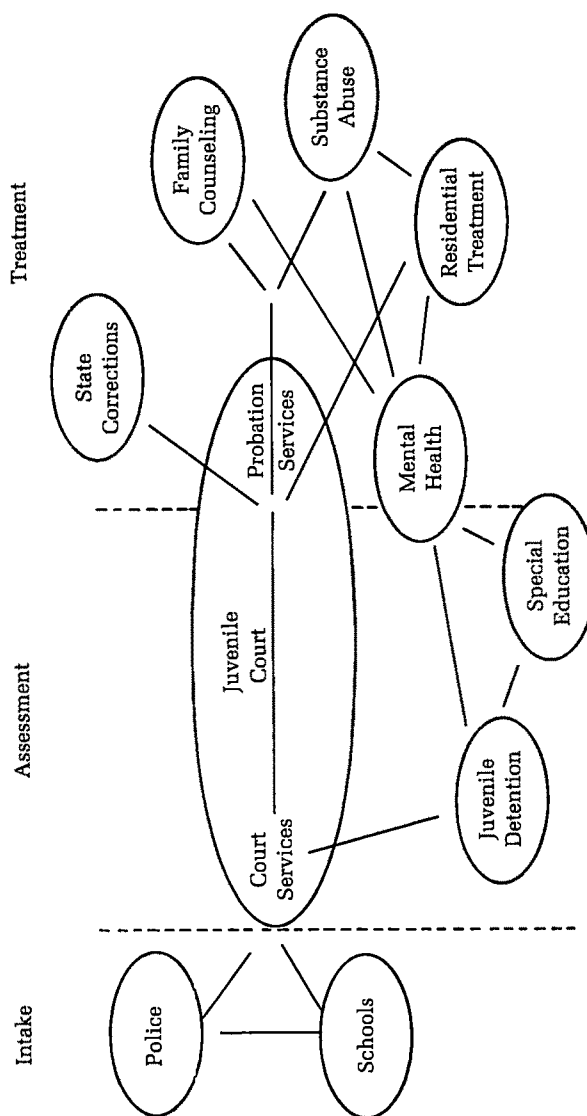
A juvenile justice system is only one of many possible interorganizational models. At the other end of the spectrum are systems, such as adoption systems, that are decentralized, provide one or a few services, and include agencies that are generalists rather than functional specialists. These are less complex, self-regulating systems with common goals and methods that have been determined internally. My point is that systemic processes like conflict and coordination are contingent upon the type of service a system provides and its structure.

Conflict and Coordination in Service Delivery Systems

Researchers have often presented conflict and coordination as the extremes of a single interorganizational dimension, the two ends of a continuum describing relationships within and between organizations (Gillespie & Mileti, 1979). In fact, a major concern in management research has been finding methods to increase control via cooperation and coordination in order to reduce conflict (Dewitt, 1977). Although that may be an effective strategy, viewing conflict and coordination in this manner is not the most helpful possible conceptualization because it casts them as opposites, with conflict seen as inimical to effective working relationships. Actually, the terms describe two separate and different dynamics that are not mutually exclusive but that occur simultaneously within interorganizational relationships (DiStefano, 1984).

The development of conflict as a conceptually discrete organizational property has not progressed far since Simmel wrote *Conflict* in 1950, and there is still no consensus about the nature of conflict within organizational contexts. Some researchers have treated conflict as a cause of poor outcomes (Assael, 1969); others have used it as an outcome itself (Schmidt & Kochan, 1972). Some models describe conflict as covarying with cooperation (Gillespie & Mileti, 1979), and others have treated it as an independent variable (Litwak & Hylton, 1962). Conventional wisdom has held that conflict within and between organizations is frequent and dysfunctional. Marxists believe conflict to be inevitable, with the resolution of old conflicts setting the stage for new conflicts in a dialectic process vital for creativity and innovation (Zeitz, 1980).

Theorists have categorized organizational conflict in a number of ways. Molnar and Rogers (1979) described types of structural conflict resulting from rules, policies, and procedures. Pondy (1969) and Frazier (1983) called relatively minor disagreements frictional conflict and called clashes over fundamental issues systemic or manifest conflict. All forms can occur in systems at the individual or the collective level (Galtung, 1967). Individuals can direct angry words or acts at other individuals, and organizations can undertake communication or action meant to neutralize, exclude, or harm other organizations.

In this study, I conceptualized conflict as an organizational behavior that occurs and reoccurs during the life of a service delivery system. Conflict occurs between individuals and organizations as organizations within a col-

lective strive to maximize their control over their dependency on the collective (Leach, 1980). Or it can occur as an oppositional process in which one party attempts to change, block, or impede the activities of another (Morrissey et al., 1982). The resolution of interorganizational conflict produces outcomes that range from withdrawal through adjustment to strengthened ties. Development occurs when the resolution of conflict enhances common perceptions, improves role clarity, and lessens task ambiguity (Frazier, 1983). My conceptualization, then, is that conflict is a property of work processes, one that is legitimate and necessary (Zeitz, 1980) and that has long-term benefits (Guetzhow, 1966; Warren, 1973).

Cooperation is believed today to be a predominant behavior of organizations in complex societies (Axelrod, 1984; Gray, 1985; Lincoln, 1985; Whetten, 1981). There are many descriptions of successful interorganizational cooperation (Beder, 1984; Mathiesen, 1971; Mulford, 1984), as well as examples of its limits (Frank, 1981; Gray & Hay, 1986; Hanf & Scharpf, 1978; Milner, 1980; Morrissey, Steadman, Kilburn, & Lindsey, 1984; Redekop, 1986). There is, however, disagreement in the interorganizational research literature over the definitions of cooperation and coordination. Some theorists have considered these concepts to be analytically distinct, stating that coordination involves deliberate adjustment and collective goals, whereas cooperation does not (Morrissey et al., 1982). In this article, I use the two terms interchangeably, subsuming coordination under cooperation as a specific form of cooperative activity (Benson, Kunce, Thompson, & Allen, 1973; Litwak & Rothman, 1970). My rationale is that few organizations would undertake joint activity without deliberation and agreement on goals, so the difference between the terms is one of degree rather than substance (Aiken et al., 1975).

Coordination is the means by which formal organizations undertake very difficult goals and manage uncertainty (Thompson, 1967). By coordinating, organizations increase their ability to deal successfully with environmental turbulence and solve problems that no single organization acting alone could solve (Mulford & Rogers, 1982). Coordination in interorganizational systems acts to control and integrate work activity across organizational boundaries. This study defined coordination, therefore, as the use of cooperative methods, and it differentiated between those used by workers and administrators.

Coordination occurs in interorganizational systems among staff members who work with the same client. To achieve common understanding and agreement on a case plan and to avoid conflicting goals and inconsistent treatment methods, tasks are integrated (Van de Ven, Delbecq, & Koenig, 1976). Researchers have identified three hierarchical task integration methods (Hickson, Pugh, & Pheysey, 1969; Mohr, 1971). Clients can flow in a sequential pattern in which there is no sharing of tasks across boundaries because the work is done at different times, as when one agency terminates a client and refers the individual to another agency, where the case plan continues. Clients can flow in a reciprocal pattern that offers the opportunity

to share tasks, as when a client receives services at the same time from two or more organizations. Finally, the members of an interagency team can treat a client simultaneously, with workers meeting face-to-face for treatment planning and client intervention (Thompson, 1967).

Coordination also occurs in interorganizational systems among administrators when they make joint decisions and accomplish joint action on behalf of a collective (Rogers & Whetten, 1982). The nature of a decision determines the type of decision-making method administrators will employ (Hage, 1974; Thompson, 1967). At one extreme are decisions with little inherent difficulty; alternatives can be specified and impersonal rules written, a method providing administrators with little feedback and representing little coordination among them. Some decisions are made within a context of moderate difficulty; alternatives are best selected ad hoc and personally by administrators, a method providing a moderate amount of feedback and representing a modest amount of coordination. Finally, there are decisions rife with difficulty; alternatives are best chosen by administrators in a group, a method providing the most feedback of the three decision-making methods and representing extensive coordination.

Service Characteristics of Interorganizational Service Delivery Systems

Although the concept of technology has played an extremely important role in research on organizations (Alexander & Randolph, 1985), research on interorganizational relationships has largely ignored it, with a few exceptions (Gillespie & Mileti, 1979; Provan, 1984). Three technological factors associated with human services are especially important for the study of interorganizational systems: scope of service, intensity of service, and client status.

As knowledge has grown, perceptions of human behavior have become more complex, broadening professional knowledge about problems and treatment solutions (Rosengren, 1968). Scope of service refers to this phenomenon; I conceptualized it as the degree to which workers view their clients comprehensively. Interorganizational systems that have a high scope of service consist of organizations that employ workers who take a holistic approach to intervention, use a detailed theoretical framework for diagnosis, and assume numerous intervention roles in their practices. According to Lefton and Rosengren (1966), some professionals take in the whole "biological space" of their clients. For example, interagency hospice teams, which typically include doctors, nurses, social workers, clergymen, volunteers, and a patient's family members, try to meet all of the patient's medical, social, psychological, and spiritual needs.

Intensity, another facet of service technology (Paulson, 1976; Provan, 1984), refers to the amount of time committed to individual clients. Services can be very concentrated, as they are in child protection programs in which a professional homemaker is in a home 40 hours per week; or services can be nonintensive, as in a prenatal health care system that requires that a client spend perhaps two hours per month with a doctor or nurse. Two perfor-

mance objectives dictate the use of intensive services. The first is quality: the more intensive a service, the more likely it is that staff members will have a comprehensive understanding of clients and be able to construct effective interventions (Dewar & Hage, 1978). The second objective is social control: the more intensive a service, the more encompassing, intrusive, and controlling it is. In the typical juvenile justice system described above, young people are placed in detention or in residential treatment facilities and required to see probation officers daily—all very intense interventions.

The third important factor influencing the structure and processes of interorganizational systems is client status. Unlike goods-producing organizations, many service sector organizations must deal with unwilling raw materials. When clients are in a system involuntarily, the community is mandating behavior change, which makes therapeutic relationships very difficult to establish and therapeutic objectives very difficult to achieve (Rosengren, 1968). Further, such systems must usually be bureaucratic—centralized and highly differentiated—so as to provide clients with close supervision and direction. In systems serving voluntary clients, on the other hand, client control and service accountability are not issues, and referral and service procedures can be flexible.

Structural Characteristics of Interorganizational Service Delivery Systems

Factors affecting the processes of interorganizational relationships occur at all levels—individual, group, organizational, and interorganizational. This study focused on three structural dimensions at the interorganizational level: centrality, differentiation, and complexity.

Centrality, a measure of power and dominance in interorganizational service delivery systems, is conceptualized as the degree to which a core agency controls client flow (MacKenzie, 1966; Van de Ven & Ferry, 1980). A decentralized system has many client pathways through the system and no one dominant focal organization. When all or many clients flow through one agency, however, it derives power from its ability to withhold clients and funding from other agencies or to slow the flow of clients and funding to them. Child protection services are good examples of systems that are high in centrality because state laws mandate that all reports of abuse be filed with the state's public child protection agency, which does all intakes and investigations and refers families to community agencies with which it has service contracts for treatment.

As in single organizations, differentiation in interorganizational structures refers to the degree to which a system is functionally specialized. Lawrence and Lorsch (1967) observed that industrial organizations are differentially organized by three basic functions: marketing, research, and production. In human service organizations, the parallel functions are intake, assessment, and treatment-intervention. Nondifferentiated interorganizational systems consist of organizations that perform all three functions for a system. For example, when adoption agencies join together to recruit adop-

tive parents for special needs children, they form an "action set" (Evan, 1966), a cluster of similar organizations that pool resources to accomplish a very difficult objective. They refer and accept children from each other, but each remains a generalist doing its own intakes, assessments, and placements. When each organization in a system fulfills only one functional role, however, the system is highly differentiated. In juvenile justice systems, the roles of police, court, and family service agencies are sharply divided, and their tasks are mutually exclusive and prescribed by law.

Whereas differentiation refers to specialization of function, complexity refers to specialization of service (Hage, 1980). There are systems that, because their client population has multiple problems, must encompass a wide range of services—social and emotional rehabilitation and treatment as well as environmental support, such as income maintenance, housing, and transportation. Complexity refers to such a variety and mix of services. At one end of the spectrum, adoption systems usually provide a single service, and at the other end, community-based service systems for the chronic mentally ill, a new phenomenon, are highly complex and encompass many diverse organizations and services because they substitute for institutional care.

HYPOTHESES

To explore the relationship between conflict and cooperation in interorganizational service delivery systems, this study tested five hypotheses using three groups of variables. The first group asserts a relationship between service technology and cooperative processes. Interorganizational systems providing services that are broad in scope and intensity are more likely to develop cooperative agreements than those operating with a narrow paradigm because their administrators and workers recognize that their clients have multiple needs that they themselves cannot satisfy. Meeting these diverse needs requires the active participation of numerous organizations. In order to assure the quality of service, coordination of administrative decision making and casework is necessary. In order for coordination to develop, organizations must have the capacity and willingness to commit the requisite staff time. Therefore,

> *Hypothesis 1: The higher the scope and intensity of service in interorganizational systems, the more interorganizational cooperation the mechanisms of administrative coordination and task integration will produce.*

Further, it is proposed that client status influences the nature of interorganizational systems. When clients are involuntary, treatment must often be intense and intrusive, as in detention and corrections. Further, when clients enter a system under orders to do so, the structure of the system tends to have bureaucratic characteristics designed to assure client control and agency accountability.

> *Hypothesis 2: The larger the percentage of involuntary clients in interorganizational systems, the more intense the services.*

*Hypothesis 3: The larger the percentage of involuntary
clients in interorganizational systems, the higher the lev-
els of centrality, differentiation, and service complexity.*

The second group of variables measures the structural properties of interorganizational systems. This cluster of variables is associated with increasing levels of interorganizational conflict. The three structural characteristics described above tend to covary in interorganizational systems, and when they increase, the level of conflict in the systems also increases. They are the properties of the bureaucratic form of interorganizational structure—central control with functional specialization and service complexity.

There are several reasons why interorganizational systems develop toward the bureaucratic form. First, when the purpose of such a system is law enforcement or social control, state governments continuously seek to meet community expectations by further formalizing it via frequent administrative reform and legislative change. As interorganizational systems become more structured, opportunities for conflict increase at all levels. Especially in differentiated and complex systems, the workers and administrators of each organization may operate using different service goals, norms, and specialized knowledge, a situation ripe for the development of dissension, disunity, and disagreement. In centralized systems, an uneven distribution of autonomy limits program flexibility and inhibits program innovation. In tightly linked bureaucratic systems, the inability to act freely may engender feuds and fights, especially among highly trained professionals.

*Hypothesis 4: The higher the levels of centrality, differ-
entiation, and complexity in interorganizational systems,
the higher the levels of conflict.*

Finally, there is the relationship between conflict and cooperation. I suggested above that the two occur simultaneously in fully operating interorganizational systems, their levels varying with a system's stage of development. There are, then, three possible relationships between conflict and cooperation: they are completely independent processes, they are positively related, or they are negatively related. The third possibility expresses the view commonly found in the management literature, that increasing cooperation will reduce conflict. Instead, I hypothesized the first possibility, that conflict and cooperation are unrelated.

*Hypothesis 5: There will be no relationship between con-
flict and cooperation in interorganizational systems.*

RESEARCH DESIGN AND METHODS

In 1986, I completed an exploratory study of 15 community-based service delivery systems, 7 of which were in Fulton County, Iowa (population 160,022), and 8 of which were in Farnam County, Illinois (population 165,968).[1] The goal of this study was to develop theoretical models of in-

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[1] Both county names are pseudonyms.

terorganizational systems using service technologies and processes as orga-
nizing concepts.

Researchers have used microstructural methods to describe and com-
pare the structures and operations of systems within a community of orga-
nizations (Laumann & Marsden, 1982). This approach requires first estab-
lishing the boundaries of all interorganizational systems within a commu-
nity and then collecting information about all the dyadic relationships
within those boundaries (Paulson, 1976). The data can be categorical or
continuous and can represent the incidence, intensity, volume, or any other
attribute of each symmetrical tie. The data are then organized in matrixes
from which an analyst can construct diagraphs that illustrate the structure
and function of a given service delivery system. Figure 1, which depicts a
juvenile justice system, is such a diagraph (cf. Van de Ven & Ferry, 1980:
Appendix F).

Selection of Systems for Study

When interorganizational systems are the units of analysis, a researcher
must identify all functioning systems within a community before selecting a
set to study. I developed a four-step selection process for this purpose.

(1) I identified all human service organizations in the counties under
study using the *Voluntary Action Center Directory*. This process yielded 126
organizations in Fulton County and 152 in Farnam County.

(2) I then established criteria for choosing organizations from this pop-
ulation. To be chosen, an organization had to be formally organized, provide
human services, and make referrals to or accept clients from other organi-
zations, or do both. Using these criteria, I excluded 120 of the 278 organi-
zations listed in the directories from consideration; examples of exclusions
are animal shelters, arts councils, and fund-raising organizations.

(3) Next, in order to inventory all systems operating within the organi-
zational fields, I mailed a survey to all organizations that had survived the
second step. The survey requested the following information: the type or
types of clients for whom the organization made or accepted referrals, the
organizations to which referrals were made or from which they were ac-
cepted for each type of client, and the number of referrals made to each
organization and accepted from each for each type of client. After personally
following up each request with a phone call, I received responses from all
selected organizations. I then used these data to identify the number and
boundaries of existing service delivery systems using the following method:
A list was made of all organizations in each county that reported having at
least one asymmetrical referral relationship, accounting for at least 12 refer-
rals per year, with another organization in the county. On a second list, I
placed all reported client types and established client categories from it. The
number of client categories represented the number of service delivery sys-
tems within the total community network. For Fulton County, this proce-
dure yielded a population of 13 systems having a total organizational mem-
bership of 72, and for Farnam it yielded 19 systems with 80 organizations.

(4) I then established criteria for selecting service delivery systems to study. To be included, a system had to be a twin—similar systems had to exist in both counties—and appear likely to maximize variation in the study's independent variables. Application of the criteria yielded 7 service systems in each county. A 15th system was added later. These 15 systems had 152 organizational members. Some multiservice organizations were members of more than one service system, however; excluding duplicates, there were 92 organizations studied, 41 in Fulton and 51 in Farnam. This data set is a useful one because researchers have conducted little interorganizational research in multiple geographic locations including such diverse service systems. The group studied includes systems delivering seven different types of services. Table 1 summarizes the process used to select systems for study and Table 2 summarizes characteristics of the systems chosen.

Data Collection and Instrumentation

Qualitative data about the 15 interorganizational service systems were collected in personal interviews with administrators of their member organizations. I located administrators with the best knowledge of services to the client population under study. This meant that administrative respondents were usually CEOs, but in very large organizations the informant was a unit supervisor or program director. I interviewed one administrator in 53 of the 92 member organizations studied; in each of the other 39 organizations I interviewed two administrators to gain comprehensive information. Thus there were 131 administrators interviewed. The purpose of the interviews was to gain a full understanding of why each interorganizational system had developed, how it had been maintained, and current pressures for change. Topics included the developmental history of a system; its governance structure; characteristics of its client population, service philosophy, and service approach; and past and current financing strategies. I wrote case studies from this material (Alter, 1988a,b,c).

TABLE 1
Summary of Selection of Systems for Study

Selection Steps	Fulton County	Farnam County	Totals
Total human service organizations	126	152	278
Organizations providing direct services	74	84	158
Total interorganizational service delivery systems	13	19	32
Interorganizational service delivery systems selected for study	7	8	15
Organizational members of selected systems			
Count with duplicates	72	80	152
Count without duplicates	41	51	92
Individual respondents			
Administrators	61	70	131
Workers	141	156	297

TABLE 2
Characteristics of the Interorganizational Delivery Systems Studied

Type of Service Performed	Size[a]	Location	Goal of System
1. Special needs adoption	5	Fulton	To achieve successful adoptions for special-needs and handicapped children
2. Special needs adoption	6	Farnam	Same as number 1.
3. Hospice care	6	Farnam	To provide alternatives to hospital care for terminally ill and improve quality of death experience.
4. Hospice care	7	Fulton	Same as number 3.
5. Maternal health care	9	Farnam	To reduce health risks for babies of teenage mothers and reduce welfare dependency.
6. Rape-domestic violence	9	Farnam	To reduce victims' traumas and successfully prosecute offenders.
7. Rape-domestic violence	9	Fulton	Same as number 6.
8. Chronically mentally ill support	10	Farnam	To maintain chronically ill in the community and prevent institutional placement.
9. Maternal health care	11	Fulton	Same as number 5.
10. Juvenile justice	11	Fulton	To rehabilitate juvenile offenders and protect life and property.
11. Frail elderly in-home care	12	Farnam	To prevent nursing home placement.
12. Juvenile justice	13	Farnam	To divert status offenders[b] from court, rehabilitate them, and protect public.
13. Frail elderly in-home care	14	Fulton	Same as number 11.
14. Child protection services	15	Farnam	To prevent child abuse and treat victims.
15. Child protection services	15	Fulton	Same as number 14.

[a] Size was measured as the number of organizations in a system.
[b] A status offense is an act for which a juvenile is brought into court that would not be criminal if committed by an adult, such as running away.

In addition, two instruments for collecting quantitative data were developed. I administered the first questionnaire during the interviews with the administrators and gave the second to employees of the member organizations at organizational staff meetings, accompanying questionnaire administration with verbal explanations of the research project and definitions of terms. I attempted to locate and administer the second questionnaire to every employee working with the client populations under study and obtained 297 responses. I employed nine concepts measured by the questionnaires in the analysis reported here: conflict, task integration, administrative coordination, scope, intensity, volitional status, centrality, differentiation, and complexity. Table 3 gives a general and an operational definition for

each concept. Four of these nine measures are indexes constructed by combining the responses to questionnaire items or multiple measures. The Appendix reports the particular method used for each measure.

Levels of Aggregation and Analysis of Data

Data for this study were collected at two levels. At the system level, the selection process described above provided measures of the structural vari-

TABLE 3
Nine Analytic Concepts

Concept	Definition	Operational Definition
Operational characteristics[a]		
Conflict	Amount of disharmony and strife between organizations in a system.	Administrators' and workers' perceptions of the severity within a system of frustration, verbal disputes, and acts, both overt and covert, meant to neutralize, injure, or eliminate rivals.
Task integration	Extent to which staff members work together interdependently across organizational boundaries.	Percentage of time workers perceive that they use sequential, reciprocal, or team methods of task accomplishment across organizational boundaries.
Administrative coordination	Extent to which administrators make decisions jointly and rely on mutual adjustment and feedback.	Percentage of time administrators perceive that they use impersonal, personal, or collective methods for decision making.
Service characteristics[a]		
Scope	Breath of service paradigm; extent to which service is narrow or wholistic.	Number of categories used in diagnosis; number of intervention roles used during treatment.
Intensity	Degree to which client services are concentrated or intrusive.	Average number of minutes workers spend with or on behalf of each client or patient.
Clients' volitional status	Degree to which clients must participate.	Percentage of workers' case loads that concern clients' under court orders to participate in and cooperate with a service.
Structural characteristics[b]		
Centrality	Extent to which one or a small number of organizations dominates a system.	Degree to which all clients flow through the core of a system.
Differentiation	Extent to which there is a division of function among organizations in a system.	Ratio of actual functional specialization to the highest degree of specialization possible in a system.
Complexity	Extent to which a variety of services are available to clients within a system.	Number of different service sectors organizations in a system represent.

[a] These data were collected at the individual level.
[b] These data were collected at the system level.

ables on the 15 systems. Since the unit of analysis in this study was the system, the use of these scores was straightforward.

Operational and service characteristics were measured for all individuals identifying themselves as working within the systems; these were 131 administrators, who answered the first questionnaire, and 297 workers, who answered the second. These 428 individuals belonged to 152 organizational units. I first aggregated the indexes and measures taken at the individual level by averaging scores across individuals, giving each respondent equal weight. The organizational units were then aggregated to the interorganizational system level.

This procedure had two important outcomes. First, since the concepts of interorganizational processes have as their most basic referent the behavior of individuals, data collected at the individual level provide the best available sample of such interorganizational behavior (Hage, 1967). Further, the use of system-level means to measure the existence of coordination and conflict provides measures based on the combined observations of more than one person. These are more stable measures than the responses of individuals can provide, and the system-mean measures are freer from measurement error and the vagaries of individual perceptual distortions (Barrett, 1970). However, data so derived will contain less variance.

The second outcome of the aggregation process is that the resulting smallness of the data set limits the types of statistical analyses that can be used. This study, then, had to rely on correlation analysis and regression analysis with only one independent variable. For this reason, its findings must be considered tentative and should not be generalized.

RESULTS

Table 4 shows the coefficients for the hypothesized relationships. Hypothesis 1 predicted an association between service technology and the amount of coordination in interorganizational systems. As the coefficients in Table 4 show, scope of service was strongly associated with task integration ($r = .83$, $p < .001$) and moderately associated with administrative coordination ($r = .61$, $p < .01$). Intensity, however, was weakly related to task integration ($r = .50$, $p < .05$) and not related to administrative coordination. The strength of some of these correlations may be due in part to the small number of systems studied, yet these results offer preliminary evidence that future research should include technological variables, especially scope of service, as antecedents of interorganizational cooperation.

Findings also supported Hypotheses 2 and 3. Services did tend to be somewhat more intense when clients were not volunteers ($r = .53$, $p < .05$). Further, the percentage of involuntary clients in a system was also associated with the degrees to which the system was centralized ($r = .53$, $p < .05$), differentiated ($r = .67$, $p < .01$), and complex ($r = .63$, $p < .05$). Thus, findings tentatively demonstrate the linkage described in Hypothesis 3 between involuntary clients and a bureaucratic structure.

TABLE 4
Descriptive Statistics and Correlation Coefficients for Process, Service, and Structural Characteristics of Interorganizational Service Delivery Systems[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8
Process characteristics										
1. Conflict	6.60	2.60								
2. Task integration	1.12	0.39	.10							
3. Administrative coordination	1.35	0.39	−.06	.62**						
Service characteristics										
4. Scope	0.86	0.15	−.11	.83***	.61**					
5. Intensity	201.00	103.00	.49	.50*	−.02	.36				
6. Clients' volitional status	0.19	0.28	.57*	.53*	−.24	−.01	.53*			
Structural characteristics										
7. Centrality	0.52	0.20	.13	.75***	.37	.52*	.50*	.53*		
8. Differentiation	0.38	0.14	.75***	−.32	−.38	−.51*	.41	.67**	.02	
9. Complexity	5.00	2.17	.59*	.18	−.18	.04	.60*	.63**	.36	.68**

[a] $N = 15$.
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

Hypothesis 4 predicted that structural factors would be related to conflict. The results showed that the systems with the most conflict were those that were highly differentiated ($r = .75$, $p < .001$) and complex ($r = .59$, $p < .05$). Here, however, there was an unanticipated result: centrality did not appear to be related to conflict. I had expected that a fair amount of conflict would arise in systems in which a core agency tightly controlled client flow, but in fact, conflict was very low in these systems. It turned out that centrality was instead associated with very high levels of task integration ($r = .75$, $p < .001$). The explanation for this finding is tentative but plausible. It may be that because the core agencies in this study controlled client flow and client-related financial resources, administrators could insist that workers cooperate with each other and attend interagency team meetings, but they did not themselves coordinate their activities with other administrators.

The last hypothesis of the study stated that conflict and cooperation are independent. The data shown in Table 4 support this statement. The correlation coefficient for conflict and task integration was .10, and the coefficient for administrative coordination was $-.06$. Contrary to popular opinion, conflict and cooperation were unrelated.

The results obtained here contain a paradox, however. Why, if the service and structural properties studied were positively associated with cooperation and conflict, were not these two processes also positively related? In other words, if using technologies increased coordination and bureaucratic properties resulted in conflict, why were the two not positively related? This question caused me to ask if the relationship was perhaps curvilinear rather than linear. To answer this question, I regressed conflict on each type of coordination separately and added a polynomial term to the equation. The result of this procedure showed that administrative coordination had little effect on conflict, but task integration had a significant effect. Figure 2 shows the plot for conflict regressed on task integration. Nonlinear analysis revealed a convex relationship between conflict and task integration. There was little conflict when task integration was either low or high but much conflict with moderate task integration (adjusted $R^2 = .48$, $F = 7.34$, $p < .01$). Rather than being independent, the amounts of task coordination and conflict occurring in the systems were strongly associated.

DISCUSSION

The results of this study suggest that both technological and structural factors may affect the levels of cooperation and conflict in interorganizational systems. Coordination, however, took two forms, each of which was high when the scope of services was high. When both administrators and workers took a broad approach to client problems and needs, they recognized that cooperation was necessary for effective service delivery and acted on this conviction. Further, interagency conflict was associated positively with functional differentiation and service complexity, which were both much higher when many clients were in a system involuntarily. Further

FIGURE 2
Scattergram of Conflict Regressed on Task Integration[a]
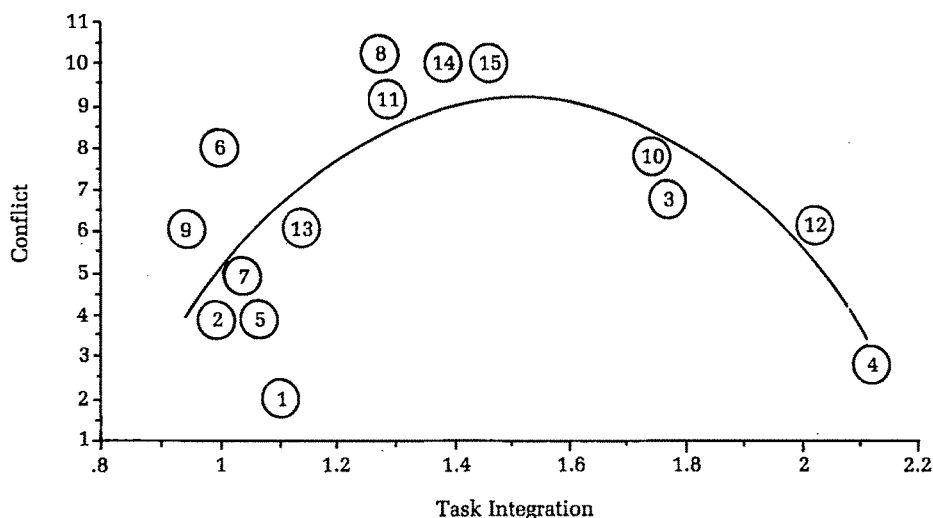
[a] The equation was computed with the polynomial term $Y(conflict) = -28.73 + 50.187x$ (task integration) $- 16.544x^2$. The data points on the scattergram represent the numbers given to the interorganizational service delivery systems in Table 2.

still, there was an unanticipated finding. Just as the preconditions for conflict and cooperation were not the same, so, too, the preconditions for the two types of coordination were different. Centrality, hypothesized to be functionally related to conflict in these systems, was actually related to the use of coordination among professional staff members. Finally, a secondary analysis pursuing the relationship between conflict and coordination revealed that high levels of task integration did indeed drive down the amount of conflict in a system. Figure 3 depicts a revision of the hypotheses based on these findings.

Figure 2 described the relationship between conflict and task integration. It could be argued that there were two groups of interorganizational systems among the 15 in this study. One included 11 systems: the special needs adoption (number 1 and 2 in Table 2 and Figure 2) and maternal health (numbers 5 and 9) systems, the rape-domestic violence systems (6 and 7), the support system for the chronically mentally ill (8), the frail elderly in-home care systems (11 and 13), and the child protection services systems (14 and 15). Conflict and task integration were positively related in these interorganizational systems. The second group had four members: the hospice care systems (3 and 4) and the juvenile justice systems (10 and 12). These four had very high task integration scores but low to moderate conflict scores. For them, task integration and conflict were negatively related. In fact, it appeared that the large amount of coordination occurring among

FIGURE 3
A Theoretical Model of Conflict and Coordination in Interorganizational Service Delivery Systems
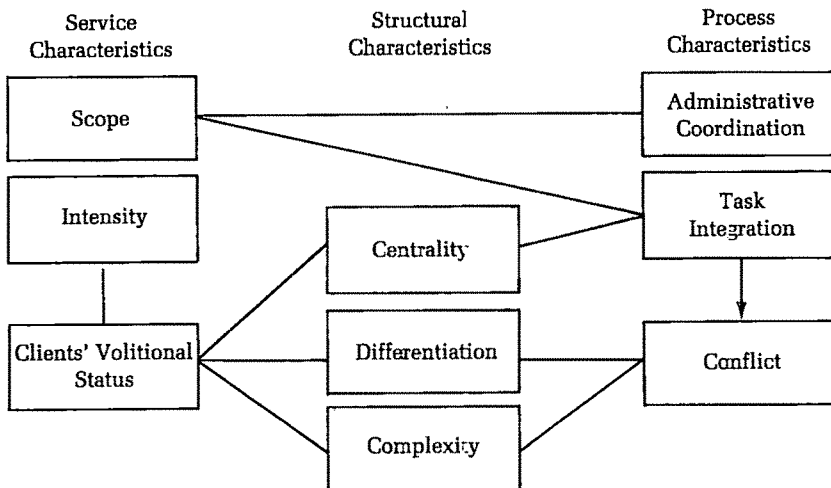
workers in these systems did indeed reduce the level of conflict. In the juvenile justice systems, for example, the court required interagency case staffing when a youth was released from detention or residential treatment and periodic reviews between probation workers and private agency staffs until the child was no longer under court jurisdiction. In the hospice systems, each patient had an interagency treatment team that met weekly for consultation and case planning. Both of these types of systems—one a state system with nonvolunteer clients, and the other a community system with private patients—were very high in centrality. All juvenile offenders entered through a court, and all terminally ill patients were first referred from a hospital, to which they often returned.

  Four systems appeared to have a great deal of conflict accompanied by a moderate amount of task integration. Two of these, a system giving support to the chronically mentally ill (number 8) and a system providing in-home care for the frail elderly (number 11) were young, newly forming systems. They did not yet have a dominant core agency to play the coordinative role, but presumably soon would. The other two of these four—the child protection systems designated as 14 and 15—arguably should have been in the second group. These systems were high in centrality and their services were very broad in scope, which should have meant adequate task integration. Qualitative data collected during the study, however, revealed that the child protection systems did not have the resources available for adequate coordination; they had overwhelmingly large case loads and inadequate state

funding. Here is evidence that adequate funding for task coordination could have had significant benefits for these systems as well as for clients.

The generalization that can be drawn from this analysis is as follows: Conflict and coordination in interorganizational service delivery systems exist simultaneously and are generally positively related to one another, a situation that is intensified when a system is differentiated by function and has a complex mix of services. There is a threshold, however, beyond which a negative relationship exists between conflict and coordination. High levels of coordination, particularly task coordination among professional staff members, will reduce the level of conflict. This situation is more likely to be found in systems that have a dominant core agency than in those that do not.

CONCLUSIONS

Constructing explanatory or predictive models of interorganizational behavior using data from cross-sectional exploratory studies is difficult in any case and is especially so when systems are the units of analyses and the number studied is small. The results of this study are limited because it was not possible to use normal regression techniques to test its multivariate model. Nevertheless, there are ideas here that are worth attention and future study by community planners and decision makers in various service delivery sectors.

Conflict undoubtedly is an unavoidable process in all interorganizational service delivery systems. It is a necessary component of the interorganizational developmental process whereby information is shared, roles and functions clarified, and disagreement over objectives and methods mediated. There are, however, systems that experience extraordinarily high levels of conflict because of the way they must be structured. They must serve client populations for which there are multiple goals, necessitating high levels of complexity and differentiation. In such cases, administrators and planners should be aware of the possibility of high conflict levels and be prepared to prevent dysfunctional conflict. Such conflict can be seen in many child protection systems today, when police threaten to arrest child welfare workers and child protection agencies take hospitals and schools to court for failure to report. The results of this study show that preventing excessive conflict is possible with the use of coordinative mechanisms.

In his study of prison and probation systems, Mathiesen (1971) showed that the horizontal networks by which administrators and workers coordinate their tasks are very different and that it is the interorganizational relationships between workers that have the most profound consequences for system operation and service outcomes. This is not to say that coordination across organizational boundaries between policy makers and managers is unimportant, but rather that coordination at the client level is at least equally important. Interorganizational research has not often incorporated this insight, nor have many federal and state agencies responsible for specific programs delivered at the community level. The governmental approach is often
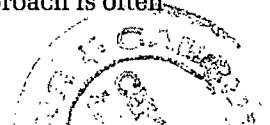
that the formalized contracts and protocols the organizations in a system have agreed to will establish and maintain working relationships. Seldom are there either incentives or resources available to workers for developing task coordination. Interagency diagnostic teams, case conferences, joint intervention, and monitoring units are all methods that may be equal to, or even more effective than, coordinated administrative planning in preventing dysfunctional conflict.

In addition to making sure that workers have ample opportunity for coordinating their work, system managers should understand that the amount of coordination achieved must match a system's requirements. The more differentiated and complex a system is, the more cooperative working arrangements are needed. Another means of controlling conflict, then, is to prevent a system from becoming unnecessarily bureaucratic. Whenever possible, rules should not replace personal contact between administrators and workers. Likewise, the inclusion of many different kinds of services within a system should be recognized as a complexifying process that brings with it the potential for escalating conflict. This is not to say that functional specialization and complexity are to be avoided: there are interorganizational systems, such as juvenile justice systems, in which the delivery of effective services mandates those structural properties. The statement does suggest, however, that the organizational principle that linkages should be simultaneously tight and loose can also apply to interorganizational systems (Peters & Waterman, 1982). Those who control state and federally funded service delivery should analyze policy and operational decisions that affect community-level interorganizational systems and separate what has to be decided from above from what should be within the domain of local administrators and workers.

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APPENDIX
Computation of Scores

Organizations' scores on each of the following questionnaire-derived measures were averaged to obtain systems' scores.

Conflict (both questionnaires). Individuals' responses were averaged and the averages summed, with equal weight given to each, to obtain an organization's scores.

Task integration (questionnaire 2). Three percentages for three types of task integration were averaged to the organizational level, with three types of client flow weighted as follows: sequential = .75, reciprocal = 1.5, and collective = 3. I then summed the three weighted scores to obtain the task integration score for each organization.

Administrative coordination (questionnaire 2). The variable was computed by taking each organization's administrator's response for each of three methods (if there was more than one administrator, their scores were averaged); weighting each of the three scores, with impersonal = 0, personal = 1.5, and group = 3; and summing the weighted scores to obtain an administrative coordination score for each organization.

Scope of service (questionnaire 1). The numbers of diagnostic categories and intervention roles indicated by each worker were taken as a percentage of the total number on a list in the item. I summed the two scores to get an individual's scope of service score and averaged individuals' scores to obtain organizations' scores.

Intensity of service and clients' volitional status (both questionnaire 1). Responses were averaged to the organization level.

The following three measures were derived from data obtained in my initial survey of organizations (step 3 in the selection procedure).

Centrality. Symmetrical type matrixes were created from data on the number of clients referred and accepted by each organization serving each client type. I then used the MacKenzie algorithm (Van de Ven & Ferry, 1980: Appendix F] to compute a centralization index representing the degree to which a core agency dominated a system and ranging from 0.0 to 1.0.

Differentiation. The index is the ratio of the number of organizations within a system performing a single function to the number of organizations in the system performing multiple functions.

Complexity. The score is the average number of different services provided by each organization in a system.

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FORMS OF INTERORGANIZATIONAL GOVERNANCE FOR MULTINATIONAL ALLIANCES

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This study drew upon complementary work in transaction cost economics, organization theory, and international corporate strategy studies to examine governance forms for multinational alliances. An analysis of 153 new alliances suggested that the selection of a contractual agreement or a joint venture as a form of governance was influenced by the intent to conduct R&D and the technological intensity of the alliance's product area alone and in interactive combination with the size of the parent firms.

Multinational firm alliances are being touted as critical mechanisms for competing in global markets and coping with the increasingly rapid pace of technological development (Ghoshal, 1987; Harrigan, 1987). Yet, although the number of international cooperations appears to be increasing dramatically (Auster, 1987; Hergert & Morris, 1988), they are notoriously unstable, prone to failure, and at best, difficult to govern (Morris & Hergert, 1987; Pucik, 1987). Prior work has suggested that the governance form chosen for these alliances may be particularly important in influencing their success and their ability to meet the objectives of the participating firms (Harrigan, 1988; Rugman, 1981).

The purpose of this study was to provide an empirical analysis of some factors underlying the choice of interorganizational governance form made in newly formed multinational cooperative relationships. We examined joint ventures, which involve creating a new legal entity with shared equity, and contractual agreements that do not involve shared equity, such as licensing, distribution, technical assistance, supply, and marketing agreements, as alternative governance modes. Both joint ventures and contractual agreements are commonly used to exchange technology, products, and services across national and firm boundaries (Harrigan, 1987; Hennart, 1988; Porter, 1986).

Our analysis focused on technological factors, building upon previous research in transaction cost economics, international strategy, and organization theory. We examined the interrelationships among form of governance, two technological factors, and parent size for a number of U.S.-Japanese cooperations announced during the three-year period from 1984 to 1986. The technological factors investigated were technological intensity as measured by the ratio between R&D expenditures and sales for the product area of the alliance and intent to conduct joint R&D. We emphasized technological factors because they are theoretically important, help link apparently divergent theoretical perspectives, and are likely to play an increasingly important role in the future formation and forms of international cooperations (Doz, 1988; Dunning, 1988). Many of the alliances made between firms with headquarters in developed nations are in high-tech areas, and many also involve joint research and development (Auster, 1986; Hladik, 1988).

GOVERNANCE FORMS AND TRANSACTION COSTS

Research in transaction cost economics, international strategy, and organization theory has addressed the development of efficient and effective governance forms for multinational cooperative efforts. According to Williamson's (1975) transaction cost perspective, balancing efficiency and protection leads firms to select a mix of hierarchies and markets to manage transactions. Market transactions, involving exchange between autonomous economic entities, frequently serve as efficient contracting modes. Their use may be hazardous or cumbersome, however, when information regarding circumstances relevant to an exchange is asymmetrically distributed between the parties or when contracts cannot adequately specify the parties' responses to changing conditions over the duration of the contract.

Given the proclivity of parties to behave opportunistically under ambiguous conditions and the high costs frequently associated with achieving information parity, the transaction costs of market exchanges may outweigh their benefits. Hierarchical internal organization will become the preferred operating mode under conditions of substantial uncertainty and complexity (Jones, 1983; Williamson, 1975).

Under transaction cost theory, incentives to exploit information differences opportunistically shrink when the parties place transactions in a single hierarchy. Further, such internal organization may enhance information coding, the convergence of expectations, and auditing control, though at greater costs than when price alone can moderate the exchange between parties (Williamson, 1975).

Agreements as Quasi-Markets and Joint Ventures as Quasi-Hierarchies

Full internalization of interfirm transactions through acquisition is, of course, not the only alternative to market-based modes of governance. As several writers have noted, firms may use a wide range of transaction forms in implementing cooperative strategies (Anderson & Gatignon, 1986; Con-

tractor & Lorange, 1988). Following the analysis of Thorelli (1986), we separated various forms of cooperation into market-dominated and hierarchically dominated forms.

Contractual agreements to sell or provide technology, products, or services (e.g., supply and licensing agreements) are market-dominated. Joint ventures, on the other hand, can be seen as quasi-hierarchies.[1] We defined a joint venture as a new legal entity with full status as a corporate entity in which both parents share equity (cf. Auster, 1987; Killing, 1988; Osborn, Hunt, & Jauch, 1980).

Joint ventures provide joint ownership and control over the use and fruits of assets (Kogut & Singh, 1988). They may be used to bypass market inefficiencies. Equity control and both parties' sharing in the profits or losses attained through the venture's performance serve to align the interests of the parent firms, reducing the opportunism that may arise in contractual agreements (Hennart, 1988; Stuckey, 1983). Complete ex ante specification of ongoing activities and behavior requirements is therefore not required (Kogut, 1988). The joint venture form may also allow for a superior monitoring mechanism, since joint venture owners may be legally entitled to independently verified financial information as well as to information acquired through direct observation.

Though a joint venture does represent a partial internalization, it does not involve complete pooling of the parent's profit streams or the establishment of a single hierarchy. As Harrigan (1988) noted, shared ownership and shared decision-making arrangements can be cumbersome to manage and may reduce the speed with which many actions in pursuit of global strategies can be taken. Although the parties can renegotiate the provisions of both contractual agreements and joint ventures at any time, a joint venture is normally considered more difficult than a contractual agreement to establish, terminate, and fundamentally change (Harrigan, 1988). Finally, differences between home and host cultures in multinational joint ventures may amplify the effort and time required to build a common hierarchy that bridges the gaps in partners' cultural, linguistic, and organizational traditions (Anderson & Gatignon, 1986; Hayashi, 1987; Moroi & Itami, 1987; Zimmerman, 1985).

In short, joint ventures may offer some potential for protection and control, but at substantial administrative costs. The time and costs involved in developing multiparty equity arrangements coupled with the need for give-and-take in jointly managed ventures gives the joint venture form of governance less strategic flexibility than less binding forms of cooperation offer (Harrigan, 1988).

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[1] As several researchers have noted, a joint venture is both legally and conceptually different from a minority equity participation investment, in which a firm invests directly into a second company (Killing, 1988; Kogut & Singh, 1988). We discuss minority equity investments later in this article.

OPTIMIZING RELATIONS AMONG TRANSACTION, TECHNOLOGY, AND STRUCTURE

Jones (1987) extended the transaction cost perspective, explicitly incorporating technological factors. He argued that "the main imperative facing organizations is three pronged—they must simultaneously optimize the relationship among transactions, technology and structure" (1987: 214). We drew two themes for studying the interorganizational governance forms of international alliances from this interactive view.

Uncertainty, Control, and Governance Form

Several authors have suggested that the recent dramatic increase in multinational alliances represents the emergence of global strategies among firms responding to the internationalization of technological competence and markets (Geringer, 1988; Osborn & Baughn, 1987; Porter & Fuller, 1986). Technological globalization is particularly evident in rapidly advancing areas characterized by high R&D-to-sales ratios. In such technologically intense areas as pharmaceuticals, computers, and semiconductors, specific technical developments in products and processes are likely to come from Japan, North America, or Western Europe.

Uncertainty and control provide a conceptual link between technological intensity and the governance form chosen for an alliance. Technological intensity, as evidenced by a high R&D-to-sales ratio, is likely to reflect high uncertainty, which raises the transaction costs of market-dominated mechanisms. Facing higher costs for monitoring, enforcing, and regulating via market-dominated mechanisms, firms might be likely to select more hierarchical forms of alliance governance as technological intensity increases (cf. Jones, 1987; Williamson, 1985).

In technologically intensive areas, firms are likely to be particularly concerned about control of proprietary knowledge, products, and services. The classic problem of information valuation through market mechanisms may also enhance a preference for transaction forms providing high control. Agreeing upon a price for information is problematic unless a buyer knows what the information is—yet once that knowledge is disclosed, the buyer need not pay for it (Anderson & Gatignon, 1986; Calvet, 1981).

Such arguments explain the relationships that researchers have found between research and development expenditures and a preference for wholly owned subsidiaries over joint ventures (Stopford & Wells, 1972). The quasi-hierarchical joint venture form does not appear to provide the protection and control attributed to complete internalization. In extending this argument to the choice between the joint venture form and nonequity forms of cooperation, we might assume that quasi-market arrangements would be the least preferred mode of transaction in technologically intensive product areas.

However, firms may prefer arms-length contractual agreements. They may use them to control what information is shared, to reduce the chance

that knowledge transfer will exceed the scope intended by the parents, and to build interfirm trust before the parties undertake more involved activities (Killing, 1988). Another line of inquiry also suggested that firms forming alliances in technologically intensive areas might prefer agreements.

Technological Positioning and Governance Form

Several investigations of rapidly evolving technological areas have suggested that a key factor for a firm's survival is its positioning within a successful network of suppliers, manufacturers, and distributors. Agreements may be preferable to joint ventures for establishing such an initial position in a new technological area.

In high-tech areas, institutional and interorganizational infrastructures are often poorly developed, likely to change frequently, and particularly weak across national boundaries (Van de Ven & Poole, 1989). Early in the development of new products, several feasible designs with various degrees of governmental support from different nations often compete. Such is currently the case with high resolution TV and such was the case with nuclear power and video cassette players. In such areas, knowledge develops rapidly as various firms move to commercialization, consider entering an area, or merely seek to monitor the development of a technology. In short, firms may be seeking to position themselves. They may still be deciding what portions of the technology to keep, whom they will use as suppliers, and how they might successfully market new products (Skinner, Donnelly, & Ivancevich, 1987; Walker & Weber, 1987). Thus, firms may seek to establish or tap institutional and interorganizational infrastructures and become viable members of a winning network of organizations (Garud & Van de Ven, 1987; Van de Ven & Pool, 1989). Only as a technology stabilizes and it becomes clear that an alliance might be an important source of revenue might firms quasi-internalize such an arrangement through an equity relationship.

In high-tech areas, firms may generate numerous technical spin-offs, many of which are not crucial to their viability. Not all can be commercialized via equity investments. Such spin-offs may also facilitate the eventual establishment of an industry standard by spreading core technological features across apparently diverse products.

Given the need for flexibility as well as the limited ability of a joint venture to protect a partner's technology, it would seem that involvement in high-technology areas would limit the feasibility of selecting quasi-hierarchical structures as governance forms. Thus,

> Hypothesis 1: To the extent that a cooperative alliance
> involves areas with high R&D intensity, agreements are
> more likely than a joint venture to be the chosen form of
> governance.

Decisions to Engage in Joint R&D

Although quasi-hierarchies like joint ventures may be expensive and time-consuming to develop and may provide only limited protection from

exploitation, firms still may prefer them when facing the technological uncertainty associated with joint research and development. Technological commercialization often yields inseparable tasks that favor a hierarchy (cf. Maitland, Bryson, & Van de Ven, 1985). Market-mediated mechanisms may not provide adequate control over the myriad of complex judgmental tasks involved in R&D. In R&D efforts, individuals often need to interact to develop both new ideas and a special language for problem identification and problem solving (Osborn, Olson, & Hanada, 1985). In joint R&D, the knowledge being exchanged is not yet fully embodied in designs and specifications but embedded in the experience and skills of people—it is what Polanyi (1958) termed tacit knowledge. Further, information asymmetries may well arise during the R&D process itself, reducing the ability of an a priori agreement to capture the value of each partner's contributions adequately. Equity links increasing the internalization of a transaction would therefore appear to be preferable for transferring noncodified technological know-how (Hennart, 1988).

The decision to engage in joint R&D may also signal a commitment to a long-term relationship between parent firms. Participating firms are moving their joint relationship back up the value-added chain, taking longer to get a payoff and to build an effective organization. Developing new products and services may also allow even the largest multinationals to adjust their global strategies to incorporate the fruits of a joint venture (cf. Porter & Fuller, 1986).

> *Hypothesis 2: The intention to conduct joint R&D increases the probability that firms will adopt the joint venture form of governance for an alliance rather than agreements.*

PARENT SIZE

Organizational size is another of the many other factors we would expect to influence the establishment and form of multinational alliances (Dunning, 1988; Kogut & Singh, 1988; Osborn et al., 1980; Porter & Fuller, 1986). Unfortunately, the theoretical meaning of size remains elusive as various researchers have interpreted it in quite different ways (cf. Kimberly, 1976). Size also remains outside the theoretical specifications of transaction cost economics. For instance, Jones (1987) questioned whether large organizations might be able to buffer themselves from specific transaction cost requirements, yet he did not incorporate size into transaction cost theory.

Organizational size can be tied to opportunism. Very large organizations may be comparatively invulnerable: With abundant slack resources, multiple technical cores, the ability to retaliate against incursions, alone or in cooperation with government, and a vested interest in protecting its reputation, a very large organization may be less concerned than a smaller firm with a potential partner's possible exploitation (Doz, 1988). Thus, the specific technological factors underlying a cooperation might not receive the

same consideration that a smaller firm would accord them. Research on global strategy has suggested that large multinationals will or should be more concerned with global strategic positioning than with the transaction costs associated with any one alliance or the tactical adjustments in form stemming from technological factors (e.g., Porter & Fuller, 1986). Several other analyses have suggested that who a large multinational links with may be more important than how the link is made (see Geringer, 1988, for a review).

Work in organization theory dating back to Blau (1970) and Blau and Schoenherr (1971) has strongly suggested that the structures of very large firms may not reflect the importance of technological factors. More recently, writers such as Hannan and Freeman (1984) and Astley (1985) have also pointed to the intransigence associated with very large organizational size. If internal structures do not vary much with technological factors for very large organizations, the structural forms adopted for multinational alliances might be similarly resistant.

Whether very large size is seen as evidence of invulnerability, a global strategy, or bureaucratic intransigence, one point is clear. The governance form of a cooperative alliance needs to satisfy both parties involved. If only one or neither one of the parties is a very large multinational, vulnerability to exploitation may exist and the economic effectiveness of the transaction itself may be deemed critical. That is, an alliance is more likely to represent a key element in a parent's overall strategy when the parent is not extremely large. In such cases, the interplay among technological factors may be quite important (Jones, 1987). For instance, a comparatively vulnerable, small firm entering a high-tech cooperation in which joint R&D is planned places its sole technical core at risk and may need the expensive protection of the joint venture form. But when such a firm is not intending to conduct joint R&D it may well attempt to protect its technical core by using the quasi-market form to control what information is to be shared (Doz, 1988; Harrigan, 1985). Conversely, if both firms are very large multinationals, the interplay among technological factors may be less important. Thus,

> Hypothesis 3: Parent size interacts with technological fac-
> tors in determining the form of governance firms choose
> for a cooperative alliance. When both parents are large
> multinationals, technological factors will be less strongly
> related to the form the alliance takes than they will be
> when neither or only one is large.

ALLIANCES, MEASURES, AND STATISTICAL ANALYSES

To examine the hypotheses stated above, we identified 270 new coop-erative industrial arrangements between U.S. and Japanese firms announced in the *Asian Wall Street Journal* and the *Japanese Economic Journal* during the 1984–86 period. This group did not include alliances involving govern-ment agencies or universities. The overwhelming majority (248) involved

two parent firms. We eliminated alliances involving more than two parents as well as cooperations involving banking firms and trading companies. We did not formally include 22 arrangements that involved equity purchases by one parent in the other in the statistical analysis but reviewed them separately. Table 1 provides some descriptive information on the alliances studied, 153 two-party arrangements with industrial sponsors for which R&D data regarding the product of the arrangement were available.

An alliance was coded as a joint venture when its announcement indicated that the parents had formed a new legal entity with equity contributions. Of the 153 arrangements, 63 (41%) were of this form (see Table 2). We coded informal arrangements, cooperative ties, developmental assistance programs, licensing arrangements, and marketing and supply arrangements as agreements.[2]

A cooperation was considered as involving large firms when its consolidated total assets were greater than one billion dollars for the U.S. firm and one hundred billion yen for the Japanese firm. We took data on the parents' consolidated total assets from *Moody's Industrial Manual* (Moody's Investors Service, 1984, 1985, 1986) and the *Million Dollar Directory* (Dun's Marketing Services, 1986) for U.S. firms and from the *Japan Company Handbook* (Toyo Keizai Shinposha, 1984, 1985, 1986) for Japanese corporations. Although the monetary cutoffs were obviously arbitrary, we felt confident that firms of this size were large enough to have the capabilities and be subject to the constraints of very large firms discussed earlier. Nearly half (46%) the alliances involved two large firms.

The technological intensity of an alliance's product was measured as the average ratio of R&D to sales over the three-year study period for U.S. firms in industries producing that product. We took this average from information published in *Business Week* (1985, 1986, 1987), which was based on COMPUSTAT data from that period (see Table 1). Only U.S. data were used as U.S. and Japanese R&D data may not be directly comparable. The financial statements of Japanese firms, for example, do not report the Japanese government's subsidizing of substantial proportions of R&D costs for designated projects nor that government's expenditures for technology transfer (Harrigan, 1985).

Evidence of an intention to conduct joint R&D was taken directly from the announcements in the *Asian Wall Street Journal* and *Japanese Economic*

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[2] Although the published tracking of announced alliances for this time period may be far from complete, the characteristics of the firms studied appear to be consistent with those given in other published data. Auster's (1986) report on U.S.-Japanese alliances, which she based on Japan External Trade Organization data, for example, shows a similar breakdown by industry and a similarly substantial proportion of alliances (43%) in high-tech industries. Both Hladik's (1988) work on international joint R&D and Takeuchi's (1988) survey of international cooperations involving Japanese firms reported that about 20 percent of the alliances involved an intent to conduct joint R&D. Finally, Auster's (1987) finding that in recent years joint ventures have accounted for between 20 and 50 percent of international cooperative linkages is consistent with data reported in Table 2.

TABLE 1
Characteristics of the Multinational Alliances Studied[a]

Industry or Technology[b]	Frequency	Percentage	Ratio of R&D Expenditures to Sales[c]
Steel	4	2.6	0.5
Textile-apparel	2	1.3	0.8
Food-beverage	4	2.6	0.9
Metals-metal products	10	6.5	1.5
Appliances	4	2.6	1.6
Auto parts	14	9.2	1.9
Tires-rubber	2	1.3	2.5
Miscellaneous manufacturing	5	3.3	2.7
Machines-industrial parts	12	7.8	3.1
Automotive	10	6.5	3.5
Chemicals	19	12.4	3.6
Electronics	7	4.6	4.4
Telecommunications	8	5.2	4.4
Aerospace	2	1.3	4.5
Precision equipment	14	9.2	6.4
Pharmaceuticals	4	2.6	7.6
Computers	19	12.4	7.8
Software	3	2.0	7.9
Semiconductors	10	6.5	10.4

[a] All the alliances studied were between U.S. and Japanese firms. Each involved two industrial firms. The study period was 1984–86. $N = 153$.

[b] The industry or technology areas were derived from the "R&D Scoreboard" of *Business Week* (1985–87).

[c] Percentages shown are three-year averages.

Journal: we simply coded the intention as present if an announcement mentioned it and as absent if it was not mentioned. About 1 in 5 (18%) of the alliances announced such an intent (Table 2).

The strategy literature suggests that industry conditions may alter preferences for various forms and types of strategic alliances (Ghoshal, 1987; Harrigan, 1988; Porter & Fuller, 1986). Industry-specific approaches to the introduction of new products and processes and differences in the attractiveness of innovation in different industries may alter the impact of technological considerations on the forms agreements take. Industry differences appear to have led to idiosyncratic findings in past organizational research (e.g., Hitt, Ireland, & Goryunov, 1988). It seemed prudent to control for basic industry type. We therefore included the categorical classification of industry type Hitt and colleagues (1988) employed as a control, classifying alliances on the basis of their product. The categories used were: (1) consumer durable goods, (2) consumer nondurable goods, (3) capital goods, and (4) producer goods.

Discriminant function analysis was used to predict the categorical criterion via a series of dichotomous and interval-level predictors (Dillon & Goldstein, 1984). To assess the importance of the technological and size

TABLE 2
Characteristics of Variables and Intercorrelations[a]

Variables[b]	Mean or Proportion	s.d.	Intercorrelations[c]			
			1	2	3	4
1. Form of alliance	0.41	0.49				
2. Technological intensity	4.48	2.71	−.21			
3. Joint R&D	0.18	0.38	.20	.21		
4. Firm sizes	0.46	0.50	.00	−.17	−.12	
5. Consumer durables	0.26	0.44	−.14	.23	.00	.08
6. Consumer nondurables	0.08	0.23	.03	.02	.04	.04
7. Capital goods	0.56	0.50	−.04	.01	−.01	−.09
8. Producer goods	0.09	0.23	.24	−.38	−.03	.07

[a] Coefficients not calculated are those among levels of a categorical variable. $N = 153$.

[b] These variables were dichotomously coded, allowing their means to be interpreted as proportions: for form, 0 = some form of agreement and 1 = a joint venture; for joint R&D, 1 = an announced intention to engage in joint R&D, 0 = no announcement; for firm sizes, 1 = both parties large, 0 = otherwise; and for the four industry membership variables, 1 = the association of an alliance's product with the given industry type, 0 = no such association.

[c] A correlation greater than or equal to .14 is needed to achieve significance at the .05 level. A correlation greater than or equal to .19 is needed to achieve significance at the .01 level.

variables over and above that of industry type, we first entered dummy variables representing the industrial categorization of an alliance into the equation and then noted the significance of the F-to-enter and the accompanying change in variance accounted for for each subsequent variable entered. Similarly, we entered cross-product terms involving the technological and size variables after including their constituent main effects. We chose to look at the significance of the partial Fs rather than the standardized discriminant function weights as the weights themselves may have provided misleading information when the predictors were correlated (Dillon & Goldstein, 1984). Because we did wish to report the discriminant function weights as well, we conducted the analysis again using the residuals of the cross-product terms calculated by regressing the cross-product terms on their component effects. This procedure, which Lance (1988) suggested, does not affect the overall variance a prediction equation accounts for or any of the main or interaction effects—the Fs-to-enter and their significance were identical to those obtained without using the residuals. Similarly, the discriminant loadings (structure coefficients) for the main effects remained unchanged. The discriminant function weights and the loadings for the interaction terms, however, more directly reflected the contribution of the variables used to classify the forms of alliances.

RESULTS

Table 2 presents the means, standard deviations, and bivariate intercorrelations among the variables used in these analyses. Since industry type was related to alliance form (Table 2), we retained it as a control.

As the data in Tables 2 and 3 show, both the technological intensity of an alliance's product area and the decision to engage in joint R&D were related to the governance form chosen for an alliance. In keeping with previous research on R&D, the intention to conduct joint R&D was somewhat more common as the technological intensity of an alliance's product area increased ($r = .21$, $p < .01$). Yet, as Hypothesis 1 predicted, agreements were the more common governance form in areas of high technological intensity ($r = -.21$, $p < .01$). The intention to conduct joint R&D was positively related to joint venture formation ($r = .20$, $p < .01$), as Hypothesis 2 predicted.

As noted above, there were 22 reported alliances involving one parent's buying equity in the other. Although there were too few of these to formally incorporate them into examination of the hypotheses, we conducted a revealing inspection of these arrangements. Half the minority equity participations involved joint R&D, versus only 11 percent of the agreements and 29 percent of the joint ventures. Again, firms chose a more elaborate governance form when conducting joint R&D.

The discriminant function model reported in Table 3 yielded a canonical correlation of .425 ($p < .01$), providing correct classification of 71 percent of the cooperative arrangements studied. As with the bivariate findings, both the technological intensity of the product of an alliance and the intention to engage in joint R&D added significant predicted variance; firm size did not.

TABLE 3
Results of Discriminant Analysis

Step	Variables[a]	F-to-Enter at Step	ΔR^2	Final Standardized Discriminant Weights	Final Discriminant Loadings
				.85	.29
1.	Industry categories	3.61*	.07	.81	.08
				.48	−.07
2.	Joint R&D (A)	7.33**	.04	−.63	−.45
3.	Technological intensity (B)	4.56*	.03	.45	.46
4.	Firm sizes (C)	0.00	.00	.00	−.01
5.	A × B	1.68	.01	−.28	−.23
6.	A × C	0.08	.00	−.05	−.03
7.	B × C	0.03	.00	−.05	.04
8.	A × B × C	5.49*	.03	.46	.36
Canonical correlation		.425**			
R^2		.18**			
Percent correctly classified		71.9			

[a] Weights and loadings for the industry categories reflect the contribution of the three dummy codes used for the four-group industry typology. Statistics shown for the interactions are residualized cross-product terms.

   * $p < .05$
   ** $p < .01$

Although firm size did not interact with the independent effects of the technological factors in influencing governance form, it did interact with the combination of technological factors. The three-way interaction of technological intensity, joint R&D, and firm size did provide a statistically significant increase in the prediction equation (Table 3).

Subsequent analysis of the significant three-way interaction (not shown in a table) indicated that engagement in joint R&D in high-tech areas was associated with the joint venture form if at least one of the firms involved was not large. For the 70 alliances in this study involving two large firms, the two-way interaction of the technological intensity of the product and the intent to conduct joint R&D yielded an increase in R^2 of only .01 (n.s.). The increase in R^2 with the addition of this interaction for the 83 arrangements involving at least one smaller firm was .05 ($p < .05$). Thus, it appears that alliances involving at least one firm that is not a large multinational are especially sensitive to the interaction of high technology and joint R&D and are likely to employ the joint venture form of governance when those factors are present.

In summary, the results are consistent with Hypotheses 1 and 2. Hypothesis 3 was supported regarding the three-way interaction of firm size and the two technological predictors, but no significant two-way interactions emerged.

DISCUSSION

When considering the governance form to use for a multinational alliance, parent firms may face conflicting pressures as they move into high-technology areas where joint R&D tends to be common. Although the two measured technological factors were significantly intercorrelated ($r = .20$, $p < .01$), they were associated with different governance forms; high technological intensity with contractual agreements and the intention to conduct joint R&D with joint ventures.

Our findings are consistent with the technological positioning discussion leading to Hypothesis 1: contractual forms may not only provide the flexibility and multiple linkages considered so important in technologically intensive areas, but also help a firm limit the flow of proprietary information across boundaries. We argued that when joint R&D is present firms will prefer the joint venture form because it (1) facilitates information flows, (2) aligns the interests of the partners, reducing opportunism, and (3) provides for day-to-day coordination. Our information concerning a small number of minority equity participations in which one firm bought into its partner is also consistent with these arguments.

The importance of an alliance to its parent firms and its role in their overall strategies may be factors in resolving the conflicting pressures of the related technological factors. Many new high-tech alliances may be devices the partners are using for technological positioning. A decision to conduct joint R&D, however, may well signal a longer-term, more important commit-

ment to the viability of an alliance as an economic entity. Over time, the role and importance of the alliance may itself evolve as it becomes more or less important and the parents decide to use it for a different purpose. For instance, an agreement in a high-tech alliance initially used for technological positioning in a network could evolve into an important new business area involving production. Or an initial agreement might yield a consensus to pursue joint R&D. In both cases we predict that the probability of adopting the joint venture governance form will increase. As Harrigan (1988) suggested, cooperative arrangements may represent transitional stages in firm positioning. The governance form of an alliance is likely to change as the value of a particular activity to overall firm strategy changes.

The themes of purpose and importance may also be inferred from the interactive findings. Statistically, there was a triple-order interaction among technological intensity, intent to conduct R&D, and firm size in analyses predicting the form of governance. Although several interpretations of these findings are possible, given the various theoretical meanings researchers have attributed to size, we see the following.

In high-tech areas in which partners opt for joint R&D, it is clear that the joint venture form is preferred when neither or only one partner is a huge multinational. In such cases, it appears that the needs for control, coordination, and protection are particularly strong. The cooperation is important to its parents, and the economic success of the venture itself is likely to be important. For a small parent (worth less than a billion dollars), an alliance is likely to be a geographic diversification move centered on its technical core (presuming, as did Thompson, that smaller firms have only one or a few technical cores). The form of an alliance needs to reflect their requirements for conducting high-tech R&D or small firms will choose not to participate (cf. Jones, 1987).

When a cooperation involves two huge multibillion dollar multinationals, however, we see a more complex situation. Even their high-tech R&D alliances might not be central to one of their many technical cores, and the economic success of the alliance itself may not be the most important consideration. For multibillion dollar multinationals, high-tech R&D alliances might represent a geographic diversification that is not directly related to an existing core business. One or both partners could be exploring new areas or spinning off secondary uses of a new technology. Given the considerable potential market power combining two multibillion dollar multinationals can yield, merely establishing an alliance might take precedence over the technical or economic success of the venture itself. Merely establishing a cooperation with the ostensible intent of conducting R&D in a high-tech area may be sufficient to block competitors' entry into that area. Here, the role of the alliance may center on global network positioning to link potentially powerful firms.

In short, this research suggests that technological factors are important for examining multinational alliances, but not necessarily in the manner much current transaction cost theorizing has suggested. Although specific

technological dimensions may be correlated, their effects on form may be quite different. Further, the role and importance of an alliance may substantially moderate the collective influence of technological factors on governance forms. Here, parents' size could represent a number of potentially important aspects, such as intransigence, potential combined economic clout, and diversification strategies. In general, we expect that the less central a cooperative alliance is to a parent's core technology and the more that strategic placement in a network is a factor, the less will the initial form of governance used for the alliance reflect technological considerations. Of course, whether the match between technological considerations and governance form is associated with the success of an alliance is a question for future research.

These results also show the need for theoretical integration of the three research streams upon which we drew. Transaction cost theorizing needs to incorporate specific technological factors, and work on technological positioning could benefit from incorporating the economic constraints so dominant in transaction cost economics. Recognition of the conflicting pressures of specific technological factors and the role of corporate global strategy in alliance forms is also needed. Recognizing the technological aspects of interorganizational networks might help economists, strategists, and organizational theorists to both integrate their theoretical positions and begin to isolate the conditions under which theory-specific perspectives apply (cf. Dunning, 1988).

Threads for future research and theorizing concerning the governance forms and evolution of multinational quasi-markets and quasi-hierarchies would include directly measuring such potentially important factors as parents' diversification strategies, market power, and global strategic positioning in addition to measuring the technological factors emphasized here. Further explorations of the role and importance of alliances do indeed appear warranted, as increasing numbers of firms directly confront the challenge of global technological competence and global markets.

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WHY DO FIRMS REDUCE BUSINESS RISK?

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Two empirical tests designed to disentangle firms' motives for reducing
business risk were performed. Results suggest that low business risk
allows firms to acquire factors of production at lower costs, to operate
more efficiently, or both. These findings are consistent with theories
assuming both value maximization and efficient capital markets.

Strategy researchers have paid considerable attention to the risk-return trade-off when assessing corporate strategy (Bowman, 1980) and have used numerous accounting measures of risk and return to evaluate that trade-off. For example, Bettis and Mahajan (1985) showed that a trade-off existed between profitability and risk; in their findings, firms that diversified into unrelated businesses usually had lower returns on assets (ROA) than firms that did not do so. However, the ROAs of the unrelated diversifiers also had lower standard deviations of ROA, representing lower risk.

Although many have used accounting measures of return and risk, other authors have questioned the measures' applicability to strategy evaluation because they reflect past investment decisions and do not 'appropriately capture the expected future cash flows a firm's stock of assets could generate. Furthermore, differences in tax laws across industries and in accounting conventions regarding R&D and advertising expenses may distort accounting-based measures (Fisher & McGowan, 1983).

Recognition of these shortcomings has led to the use of market measures in a growing number of strategy studies (Amit & Livnat, 1988, 1989; Wernerfelt & Montgomery, 1988). Bettis (1983) and Aaker and Jacobson (1987) investigated the role various types of market risk play in explaining profitability differences among business units. They observed that the Capital Asset Pricing Model (CAPM), which is commonly used to assess the risk-adjusted return on a particular stock (Lintner, 1965), separates risk into two components: (1) market, or systematic, risk, which captures the variation in

a stock's return ascribable to market-wide forces, and (2) business, or unsystematic, risk, which reflects the variation in a stock's return ascribable to firm-specific forces (e.g., an organization's R&D intensity). According to the CAPM, since investors can diversify away business risk, they only worry about the market risk of a stock, which is called its beta. Thus, under the assumptions of the CAPM, corporate managers should not be concerned with reducing their firm-specific business risk since it should have no effect on their firms' stock returns.

Thus, business-risk management is unnecessary from the perspective of the CAPM. However, Bettis (1983) suggested that managing business risk lies at the heart of competitive strategy. Moreover, theorists have depicted the management of business risk as central to organizational evolution, a determinant of which organizations survive and grow and which decline and die (Child, 1972; Summer, 1980). These observations, along with ample anecdotal evidence from corporate annual reports and the business press (e.g., Ross, 1987), suggest that management researchers and practitioners generally feel that business risk does—or should—matter in strategy making.

The controversy, which has been primarily interdisciplinary, has focused on two issues. The first is the issue of the efficiency of capital markets[1]: Some strategy studies (e.g., Naylor & Tapon, 1982) have focused on total risk, namely the sum of systematic and business risk, whereas in an efficient capital market business risk should not matter (Wernerfelt, 1985). Second is the issue of value maximization: Financial theory suggests that the maximization of value for shareholders should be the only objective of managers. However, the desire (or need) of managers to satisfy multiple stakeholders—such as employees, suppliers, and surrounding communities—and not just shareholders is inconsistent with financial theory (Freeman, 1984). These conflicts remain unresolved.

In this study, we offer a possible resolution of the controversy. We provide empirical evidence consistent with a theory that assumes efficient capital markets and value maximization but also depicts reduction of business risk as beneficial to stockholders. To build our argument, we briefly review some theories about business-risk reduction and then describe empirical tests conducted to discriminate among them. Among other things, our findings suggest that reducing business risk allows a firm to reap higher average cash flows.

MOTIVES FOR REDUCING BUSINESS RISK

Previous research has advanced three motives for business-risk reduction that are not mutually exclusive. The first concerns the conflict between managers and shareholders surrounding the formers' role as the shareholders' agents. Two versions of this motive for business-risk reduction have

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[1] Readers unfamiliar with exact definitions of this and other concepts drawn from financial theory are referred to Brealey and Myers (1984).

been offered. In one, managers seek to reduce the probability of bankruptcy in order to enhance their job security and preserve their investment in firm-specific human capital. They may thus take actions to reduce business risk that could be to the detriment of shareholders (Amihud & Lev, 1981). The other version of the agency motive for business-risk reduction maintains that if risk-averse managers are compensated on the basis of their firm's earnings, they prefer a stable earnings stream. They may thus take a variety of risk reducing actions at the expense of shareholders (Holmstrom, 1979). In both versions, the agency problem arises because managers care about total risk (market risk as well as business risk). Shareholders, however, care only about the systematic component of total risk, since they can diversify their portfolios to compensate for business risk. Thus, according to this motive for business-risk reduction, a positive relation should exist between business risk and firm value: Relatively low firm value should be associated with relatively low business risk. We refer to this motive as the *agency motive* for business-risk reduction.

The second motive for business-risk reduction derives from the effect of uncertainty about the operations of a firm on its cash flows. In stable environments, corporations' operations should be efficient and the volatility of their earnings should be low. Conversely, in unstable environments, firms' operations might be less efficient and their earnings more volatile. Production planning provides a simple example. In a stable environment with little uncertainty about the demand for firms' products, they can efficiently manage production scheduling, finished-goods inventory management, and the timing and amounts of supplies of raw materials and labor. Firms can thus realize numerous cost savings. A special case of this argument is a situation in which a risk-averse manager who is compensated on the basis of cash flows is willing to work for less compensation if cash flows are stable. In such a setting, it is in the interest of shareholders to reduce business risk (Amihud, Dodd, & Weinstein, 1986; Aron, 1988; Marshall, Yawitz, & Greenberg, 1984). This class of arguments suggests in effect that low business risk allows firms to acquire inputs cheaply or to operate efficiently.[2] In industries that are less than perfectly competitive, reduced business risk will enhance a firm's market value.[3] Thus, according to this motive for business-risk reduction, a negative relation should exist between cash flows and business risk; that is, associated with lower business risk are higher cash flows. We refer to this motive as the *cash-flow motive*.

The third motive for business-risk reduction stems from transaction costs, such as brokerage fees and time costs, that prevent stockholders from diversifying away business risk completely (Constantinides, 1986). They thus reduce the overall riskiness of their portfolios by holding stocks with

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[2] Recent research in organizational theory may also support this motive for business-risk reduction (Keats & Hitt, 1988).

[3] Under perfect competition, firms would lose any gains in value through competing.

low total risk, which means that they are willing to accept lower returns on stocks with lower business risk. Assuming capital market equilibrium, this observation translates into a lower market return on the stocks of firms with lower business risk. Business-risk reduction in this case is also in the interest of stockholders. Thus, we postulate that a positive relation exists between rates of return and business risk; that is, associated with lower business risk are lower rates of return. We refer to this motive as the *rate-of-return motive*.

STUDY DESIGN AND HYPOTHESES

The purpose of this research was to discriminate among the agency, cash-flow, and rate-of-return motives. All three motives are consistent with assumed capital market equilibrium, and only the agency hypothesis suggests that risk reduction is against stockholders' interests.

The market value of a firm is the expected net present value of future cash flows. Thus, a reduction in business risk may affect the market value of a firm through either cash flows or through the discount rate. In discriminating between these two factors, we note that future cash flows are discounted by a firm's cost of capital which, for an equity financed firm, is given by the return on its stock as specified by the CAPM.

A positive cross-sectional relationship between business risk and market value would thus support the agency motive and reject the other two. Conversely, a negative relationship would point toward either the cash-flow motive or the rate-of-return motive. The first empirical test we performed directly examined the relationship between business risk and value.

If low business risk yields higher firm value, either the level of cash flows or the rate at which they are discounted must be responsible. Our rate-of-return argument suggested that low business risk benefits stockholders through low discount rates, and the cash-flow argument suggested that stockholders benefit from high cash flows. Because of data limitations, we pursued a process of elimination by looking at the cross-sectional relationship between business risk and rate of return. The existence of a positive relationship would support the rate-of-return argument, while lack of such an effect would indicate that the cash-flow argument was the only one consistent with the tests.

Figure 1 summarizes the methodology we used, which pointed to the testing of the following specific hypotheses:

Hypothesis 1: Agency. There is a positive relationship between business risk and firm value.

Hypothesis 2: Cash flow. There is a negative relationship between business risk and the level of cash flow.

Hypothesis 3: Rate of return. There is a positive relationship between business risk and rate of return.

As stated, data limitations prevented us from testing Hypothesis 2 directly. However, as the preceding discussion suggests, we were able to test Hypothesis 2 indirectly by eliminating Hypotheses 1 and 3.

FIGURE 1
The Logical Structure of the Empirical Tests
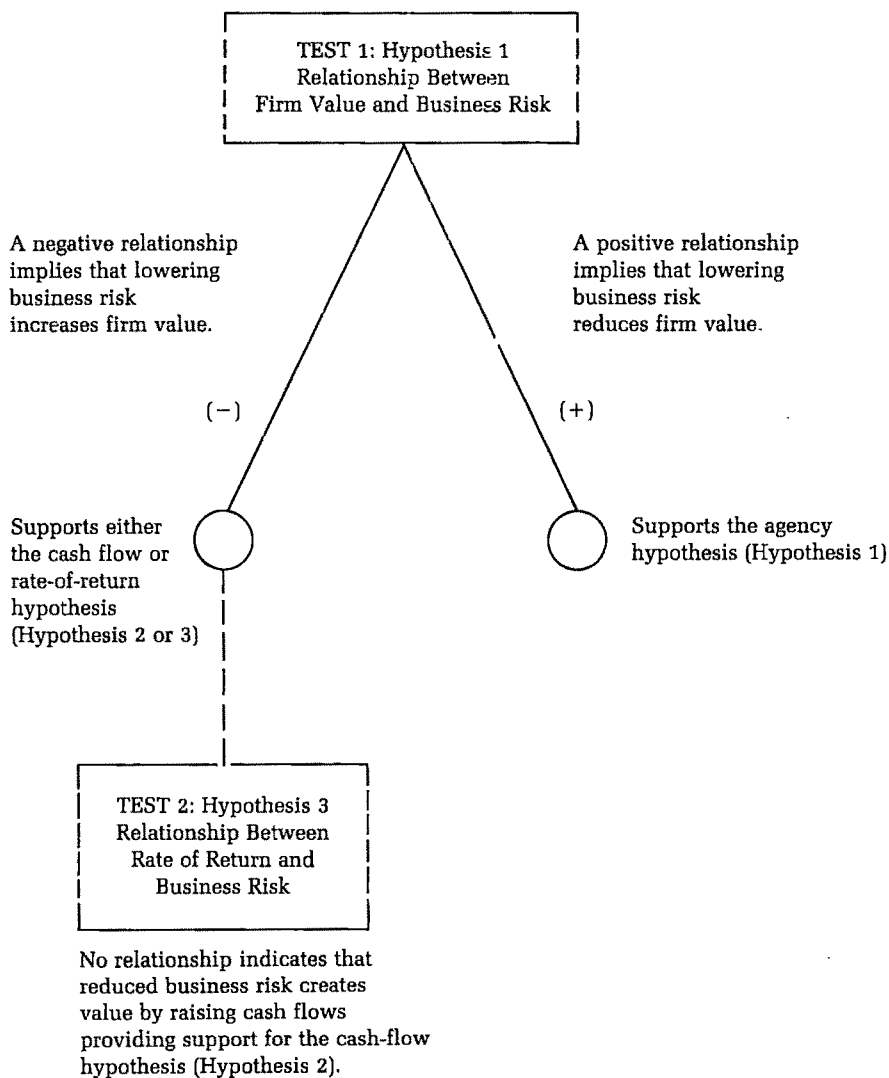
METHODS

Value and Business Risk

Our measure of firm value was Tobin's q, defined as the ratio of the market value of a firm's equity and debt to the replacement cost of the firm's assets (Lindenberg & Ross, 1981). Formally, let

$$\text{Tobin's } q_i = \frac{V_i}{K_i}, \qquad\qquad 1$$

where

V_i = the market value of firm i

and

K_i = the replacement value of firm i's assets as reported on its 10-K form.[4]

Market value, the numerator of the ratio, is the expected discounted net present value of future cash flows. It reflects the market's expectation of the cash flows that a firm's asset base can generate. In the absence of any market or measurement imperfections, the value of a dollar invested in the firm should equal just one dollar, and the ratio should equal unity. Higher values reflect higher average cash flows or lower discount rates. Tobin's q, which captures the value created per invested dollar, provides a measure of the premium (or discount) that the market is willing to pay above (or below) the economic replacement costs of a firm's assets. Tobin's q will thus capture any above normal or subnormal returns expected from a collection of assets. Theoretically, q is a much more appealing measure than accounting returns. By incorporating a capital market measure of firm rents, q implicitly uses the correct risk-adjusted discount rate, imputes equilibrium returns, and minimizes distortions due to tax laws and accounting conventions.

Business risk is the component of total risk about which stockholders are indifferent because it is diversifiable. We measured business risk as the standard deviation of the residual term e_i in the so-called market model, which is depicted by:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}, e_{it} \sim N(0, \sigma_i^2),\qquad\qquad 2$$

where

R_{it} = the return of security i on day t,
R_{mt} = the corresponding return of an equally weighted market portfolio,

and

α_i, β_i, and σ_i = firm-specific parameters.

The most immediate way to proceed would have been to examine the correlation between a firm's value, q_i, and its business risk, σ_i. Such a procedure, however, ignores the other factors influencing firm value. Two classes of factors are important. First, in practical calculations of q_i, the denominator does not account for intangible assets, so q is overstated for firms with high levels of intangible assets. To correct for this overstatement, we followed Salinger (1984) and controlled for estimated advertising and R&D costs divided by the replacement value of physical capital. Second, it is

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[4] Form 10-K is an annual report submitted by publicly held corporations to the Security and Exchange Commission. It contains complete, audited financial statements.

necessary to control for sources of value creation other than business risk that affect the numerator of Tobin's q. To do so, we borrowed a specification from Montgomery and Wernerfelt (1988) and controlled for market growth and concentration as well as for market share, foreign sales, and diversification. Using the ordinary-least-squares (OLS) procedure, we estimated the following equation:

$$q = \alpha + \beta_1\left(\frac{advertising}{K}\right) + \beta_2\left(\frac{R\&D}{K}\right) + \beta_3(market\ growth)$$

$$+ \beta_4(market\ concentration) + \beta_5(market\ share)$$

$$+ \beta_6(diversification) + \beta_7(foreign\ sales)$$

$$+ \beta_8(business\ risk) + \epsilon. \qquad\qquad 3$$

In this equation, the firm i index is suppressed and the error term ϵ is assumed to be normally distributed, with a zero mean. The Appendix defines the variables used in the equation. Our logic was that if estimation revealed a negative and significant coefficient (β_8) for the business-risk variable in this equation, we could conclude that low business risk augments firm value and reject Hypothesis 1.

Returns and Business Risk

As discussed above, the relationship between firm value and business risk can have two sources: business risk may affect the equilibrium rate of return, the expected level of cash flows, or both. The test we have outlined did not allow us to discriminate between these two effects. We therefore conducted a second test to see if equilibrium stock returns were related to business risk.[5]

To estimate rate of return, we used Jensen's (1969) performance evaluation model, which is depicted by:[6]

$$R_{it} - R_{ft} = \alpha'_i + \beta'_i(R_{mt} - R_{ft}) + e'_{it}, \ e'_{it} \sim N(0, \sigma'^2_i), \qquad 4$$

where

R_{ft} = the return on a portfolio of treasury bills on day t.

The estimates of α'_i (Jensen's alpha) capture returns in excess of those predicted by the CAPM. Thus, if stockholders only value systematic risk and the capital market satisfies the assumptions of the CAPM, the expected value of α'_i is zero. To test whether returns are related to business risk, we corre-

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[5] Lintner (1965), Douglas (1969), Miller and Scholes (1972), and Lehmann (1986) have tested this relationship.

[6] Roll (1978), Admati and Ross (1985), and Connor and Korajczyk (1986) have pointed to conceptual problems underlying the CAPM.

lated α_i' with business risk, σ_i'. To perform the test, we needed to get independent estimates of those parameters. Since efficiency in capital markets implies day-to-day independence of stock prices, estimates of α_i' and σ_i' can be obtained by estimating their values on alternate days. Thus, we estimated α_i' in Equation 4 on the even dates and obtained independent measures of business risk, σ_i', by estimating the equation on odd dates. For comparison, we also estimated Equation 2. A positive and statistically significant correlation between α_i' and business risk, σ_i', would suggest that investors accept lower levels of return on stocks with lower business risk. If no such relation is observed, then the increase in firm value associated with a reduction in business risk may indeed be due to higher cash flows.

Variables and Data

Computations of the market model in Equation 2 were performed using daily data for 1976 from the Center for Research on Security Prices (CRSP). Stephen Ross, of Yale University, prepared estimates for 1976 of Tobin's q, the dependent variable in Equation 3, using data from an initially random sample of 246 firms. Missing data reduced the sample size to 151 observations for the regression analysis and 154 for the correlational analysis. (The method of calculating q is described in Lindenberg & Ross, 1981.) We obtained our estimates of firms' sales and market shares from the Economic Information Service (EIS) data base provided by Trinet, Inc., and obtained foreign sales figures from the EIS *Directory of Top 1500 Companies*. Finally, we took data on replacement costs from firms' 10-K reports and industry data from the Federal Trade Commission's (FTC) *Line of Business Report* of 1976.

Table 1 gives summary statistics for the variables used in the regression equation (Equation 3). The low correlations between the explanatory variables are interesting to note. Further, the mean value of Tobin's q is close to unity, as theory suggests.

RESULTS

The agency hypothesis was tested by observing the sign and significance of the business risk coefficient in Equation 3. Table 2 shows the results of the OLS estimation of that equation. The relationship between q_i, the dependent variable, and σ_i, firm business risk, is negative and statistically significant. Two caveats are in order. First, since both q_i and σ_i were estimated, measurement error is obviously involved, which should bias the estimated regression coefficient toward zero. Second, since q_i is positive by definition, the error term cannot be strictly normal. Examination of the residuals, however, did not reveal that any problems resulted.

On the basis of the results presented in Table 2, we tentatively ruled out the agency hypothesis and turned to a test designed to discriminate between the cash-flow and rate-of-return hypotheses.

To test the rate-of-return hypothesis, we estimated the CAPM model in

TABLE 1
Summary Statistics[a]

Variables	Means	s.d.	Minimum	Maximum	1	2	3	4	5	6	7	8
1. Tobin's q	0.986	0.463	0.410	2.840								
2. Advertising/K	0.063	0.060	0.000	0.298	.46*							
3. R&D/K	0.014	0.013	0.000	0.063	.34*	.33*						
4. Market growth	0.894	0.381	0.283	2.420	-.10	-.21*	-.08					
5. Market concentration	42.000	15.000	2.000	91.000	-.03	.01	.11	-.11				
6. Market share	0.080	0.091	0.001	0.582	.20*	.17*	-.02	-.12	-.57*			
7. Diversification	0.759	0.419	0.000	1.740	-.21*	.00	-.02	-.10	-.17*	-.26*		
8. Foreign sales	0.192	0.138	0.049	0.569	.17*	.08	.09	.10	-.01	.12	-.02	
9. Business risk	0.015	0.005	0.007	0.040	-.21*	.11	.08	-.16*	-.02	-.28*	.02	-.11

(Columns 1–8 are headed "Pearson Correlations".)

[a] N = 151.

* p < .05, two tailed test

TABLE 2
Results of the Ordinary-Least-Squares Regression Analysis[a]

Independent Variables	b	Standard Errors
$\dfrac{Advertising}{K}$	2.907***	0.57
$\dfrac{R\&D}{K}$	8.589**	2.60
Market growth	.090	0.08
Market concentration	−.004	0.00
Market share	.383	0.47
Diversification	−.234**	0.08
Foreign sales	.286	0.22
Business risk	−22.578***	6.70
$\bar{R}^2$	.3534	
F	9.998***	

[a] $N = 151$. The dependent variable is Tobin's q.
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

Equation 4. The estimation procedure yielded estimates of α_i' (market rates of return) and σ_i' (business risk). We then computed the correlation coefficient. Table 3 shows the results of this test.

The small and insignificant correlation coefficient does not support the rate-of-return hypothesis, which posits a statistically significant positive relationship between business risk and market return. The caveats attached to the statistics in Table 2 are also relevant here, however: Measurement error biases our results towards zero, and the distributional assumptions cannot strictly hold.

By elimination, the empirical results therefore suggest that the negative effect of business risk on Tobin's q is through improved cash flows rather than through lower discount rates.

CONCLUSIONS

The results of this study support the thesis that lowering business risk is valuable because, ceteris paribus, it allows firms to increase cash flows.

TABLE 3
Correlations of Business Risk with Jensen's Alpha[a]

Business Risk	r	F	Sign
Computed from			
Market model	.063	.600	.439
CAPM	.063	.598	.440

[a] $N = 154$. r denotes the correlation coefficient between business risk and Jensen's alpha. The business risk was computed from the market model (Equation 2) and from the CAPM (Equation 4).

This finding suggests that not all risk reduction is counter to stockholders' interests and that enhanced operational efficiency is the main reason it is not. We cannot dismiss the agency explanation for risk reduction and thereby conclude that all risk reduction benefits stockholders; neither can we dismiss any number of other alternative explanations. However, our results are consistent with assumptions of value maximization and efficient capital markets. The results shown in Table 2 underestimate the magnitude of the efficiency effect because Tobin's q only reflects the fraction of gains appropriated by the stockholders. To the extent that firms operate in competitive markets, there will be no effect on q, even though all industry participants will have lower costs because prices will be driven down to reflect the lower costs.

It is our hope that this study will contribute to strategy researchers' perspectives on managerial risk reduction. The findings of this study also have important implications for managers. We suggest that some managerial actions aimed at business-risk reduction are indeed desirable from the perspectives of both managers and shareholders and therefore should not be condemned. This study also points to a need for further research into the mechanisms through which reduced risk enhances efficiency. The compensation effects highlighted in the literature may be one such mechanism, but smooth production and low input costs should matter more. It is tempting to cite Bettis, who observed that "unsystematic risks obviously are associated with firm-specific resources and competencies and with the relationship of the environment to the firm" (1983: 408). Going further along those lines, it may be possible to relate this gain in efficiency to the organization theory literature whereby managers create structures to reduce uncertainty produced by environmental volatility (e.g., Burns & Stalker, 1961; Dess & Beard, 1984; Thompson, 1967).

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APPENDIX
Definitions of Variables
Used in Equation 3

$$\left(\frac{\text{Advertising}}{K}\right)_i = \frac{\sum_{j=1}^{n} A_j M_{ij}}{K_i},$$

where

K = the replacement value of a firm i's assets,

M_{ij} = firm i's sales in industry j as defined by the Federal Trade Commission,[a]

A_j = the ratio of marketing expenditures to sales in industry j.[b]

$$\left(\frac{R\&D}{K}\right)_i = \frac{\sum_{j=1}^{n} R_j M_{ij}}{K_i},$$

where

R_j = the ratio of R&D expenditures to sales in industry j.[b]

$$\text{Market share}_i = \frac{\sum_{j=1}^{n} M_{ij} S_{ij}}{\sum_{j=1}^{n} M_{ij}},$$

where

S_{ij} = firm i's market share in industry j.[a]

$$\text{Market growth}_i = \frac{\sum_{j=1}^{n} M_{ij} G_j}{\sum_{j=1}^{n} M_{ij}},$$

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[a] Data came from the EIS data base.

[b] Data came from the *FTC Line of Business* data base.

where

G_j = the growth rate of industry j in the 1972–77 period.[a]

$$\text{Market concentration}_i = \frac{\sum\limits_{j=1}^{n} M_{ij} C_j}{\sum\limits_{j=1}^{n} M_{ij}},$$

where

C_j = the four-firm concentration ratio of industry j[b] (in percent).

Foreign sales$_i$ = the percentage of firm i's sales going to exports.[c]

Business risk$_i$ = the standard deviation of residuals in the market model as given by Equation 2.[d]

$$\text{Diversification}_i = \sum\limits_{j=1}^{n} M_{ij} \sum\limits_{\ell=1}^{n} M_{i\ell} d_{j\ell},$$

where

d_{ji} = 0 if j and i have the same three-digit code,

d_{ji} = 1 if j and i have different three-digit codes but the same two-digit code,

and

d_{ji} = 2 if j and i have different two-digit codes.[e]

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[c] Data came from *EIS Directory of Top 1500 Companies.*

[d] Data were estimated from CRSP tapes.

[e] We based this measure on the concentric index proposed by Caves, Porter, Spence, and Scott (1980).

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TASK REVISION: A NEGLECTED FORM OF WORK PERFORMANCE

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This study addressed the problem of task revision, a virtually unre-
searched issue in the work performance literature. We defined task
revision as action taken to correct a faulty procedure, an inaccurate job
description, or a role expectation that is dysfunctional for an organi-
zation. Two experiments were constructed to measure task revision and
test for its determinants. Results showed that goal setting inhibited task
revision; instructions to "do your best" were superior to a specific goal.
Facilitators of task revision were the salience of alternatives and being
in a supervisory position with accountability pressures. We discuss the
implications of these results in terms of the functions of counter-role
behavior for organizations and the need to broaden the construct of
work performance.

Work performance has long occupied a central role in organizational
research. It was the primary issue during the beginnings of industrial psy-
chology (e.g., Munsterberg, 1913), of major concern during the human rela-
tions movement (e.g., Likert, 1961), and at center stage as empirical research
blossomed in organizational behavior (e.g., Vroom, 1964). Now voluminous,
the literature on work performance ranges from the extensive study of orga-
nizational and social factors that influence work behavior to the analysis of
cognitive processes underlying task effort.

In recent years, the most common form of performance research has
translated the issue into a cognitive question. The aim has not only been to
find conditions under which people will work harder, but to explain the
mental processes underlying task activity. For example, early versions of
need theory, which emphasized stages and growth in human desires, have
gradually given way to expectancy models in which valued outcomes are a
part of a cognitive calculus hypothesized to precede behavior. Likewise,
reinforcement theory, with its emphasis on external incentives and behav-
ioral learning, has been overtaken by goal-setting approaches in which sa-
lient outcomes serve as mental targets for behavior. Though we do not yet
know exactly how individuals process information in performance contexts,

the overall trend has been to push performance questions back to the mental processing stage, converting performance research into a subtopic of decision making and cognition.

With performance research so strongly focused on the cognitive processes leading up to performance, researchers have given much less attention to the dependent variable itself. In general, this has meant that performance has been interpreted as the straightforward completion of work, as prescribed by task instructions in laboratory experiments or supervisors' expectations in field studies. Recently, however, some research has started to broaden the performance construct by addressing activities not part of standard role behavior.

Under the rubric of extrarole behavior, a number of studies have examined alternative forms of performance, such as aiding co-workers, defending an organization to outside publics, volunteering for unpaid tasks, and putting forth effort beyond that required by a job. Because these extrarole behaviors are typically activities that help an organization or co-workers, researchers have used terms like organizational citizenship (Organ, 1988) and prosocial organizational behavior (Brief & Motowidlo, 1986) as descriptors, while theoretical explanations have ranged from altruism (Smith, Organ, & Near, 1983) to intense socialization (O'Reilly & Chatman, 1986) and commitment (Mowday, Porter, & Steers, 1982).

Though research on extrarole behavior has enlarged the concept of performance beyond that generally used in cognitive studies of work effort, some tacit assumptions have placed what we think are premature limits on the construct. As currently conceived, the notion of extrarole behavior implies a set of activities that go *beyond* managerial expectations. By virtue of their extra work and cooperation, role occupants who practice such behavior are considered ideal employees, at least as viewed by their immediate supervisors or the current management of their organization. In contrast, a broad array of counter-role behaviors that are part of neither a formal job description nor management's likely conception of the ideal employee have been largely left out of performance studies. Included under the rubric of counter-role behavior would be forms of deviance and dissent, ranging from vocal protests over the way a role is performed to the more quiet changes that people may introduce to revise or redirect their work roles. Thus, whereas previous studies of extrarole behavior have dealt with activities that go beyond organizational expectations, generally ignored have been counter-role behaviors that are neither anticipated nor necessarily seen as desirable by existing management. The present study examined one form of such counter-role behavior.

PERFORMANCE AND COUNTER-ROLE BEHAVIOR

Why Study Counter-role Behavior?

The most obvious reason for studying counter-role behavior is that such activity may be functional for an organization, even though current manage-

ment does not prescribe it. Katz and Kahn explicitly stated this point when they noted that effective organizations require more than dependable role performance: "No organizational planning can foresee all contingencies within its own operations, can anticipate with perfect accuracy all environmental changes, or can control perfectly all human variability. . . . An organization which depends solely upon its blueprint of prescribed behavior is a very fragile social system" (1966: 338).

Van Maanen and Schein (1979) also defended the value of counter-role behavior in their analysis of socialization strategies. They distinguished between custodial behavior, in which people fully accept the norms of an organization, and innovative behavior, in which they reject or redefine the knowledge, strategies, and mission of a work role. Graham's (1986) work on "principled organizational dissent" and Near and Micelli's (1987) studies of whistle-blowing have made similar points. Their research suggests that having individuals protest improper organizational actions or practices can improve the long-term welfare of an organization. Hirschman (1970) also noted the functions of "voice" (as opposed to "loyalty" and "exit") on the efficiency of firms, and Coser (1957, 1967) argued that dissent and conflict, though usually suppressed by social systems, may be a major source of innovation and adaptation.

Of course, counter-role behavior may not always be so functional for an organization. Dissent can take time and energy away from a firm's ongoing productive operations. And deviance, no matter whether it comes in the form of revising work procedures or veering away from organizational goals, can be a costly departure from the established order. Nonetheless, somewhat parallel critiques can also be leveled at both standard- and extrarole behaviors. As Figure 1 shows, the critical condition determining the functionality of role behavior, whatever its form, may be the accuracy of an assigned role.

FIGURE 1
Varieties of Role Behavior and Their Performance Consequences

	Standard Role Behavior: Meets Expectations	Extrarole Behavior: Beyond Expectations	Counter-role Behavior: Differs From Expectations
Correctly Specified Role	Ordinary good performance	Organizational citizenship/ prosocial behavior (excellent performance)	Deviance, dissent, and grievance (poor performance)
Incorrectly Specified Role	Bureaucratic behavior (poor performance)	Bureaucratic zeal (very poor performance)	Role innovation/ task revision and redirection (excellent performance)

Figure 1 illustrates that standard role behavior—what most practitioners and researchers consider to be good performance—may not be so functional when roles are incorrectly specified. Doing things by the book, diligently carrying out the directives of management, can therefore be labeled rigid bureaucratic behavior when the rules and procedures are themselves counterproductive (Gouldner, 1954). Likewise, extrarole behavior, so valued by employers as a sign of conscientiousness and extraordinary performance, can be interpreted as bureaucratic zeal when roles are wrongly directed. Thus, as shown in Figure 1, a worker who goes beyond the call of duty to accomplish a misconceived job may actually be more dangerous to an organization than a more mundane performer.

Figure 1 also outlines some costs and benefits of counter-role behavior. As noted, when a role is correctly specified, counter-role behavior can be interpreted as needless deviance from an efficient system. In contrast, when roles are misspecified or a larger system is malfunctioning (Perrow, 1984), counter-role behavior can be immensely valuable. In such cases, those who have been labeled deviants may be considered organizational innovators, since they provide new perspectives for the system as it adapts to changing environmental or task conditions (March, 1983; Weick, 1983). Furthermore, it can be argued that counter-role behavior is useful, not only when roles are misspecified in the immediate term, but as an investment toward longer-run adaptiveness, when current specifications for a job may no longer be applicable (Nemeth & Staw, 1989).

Task Revision and Redirection

Of the many possible counter-role behaviors, taking action to correct a faulty task or misdirected work role is probably one of the most clearly functional. Such behavior is the kind of endeavor Van Maanen and Schein (1979) referred to as role innovation and Katz and Kahn (1966) called spontaneous and innovative behavior. The term innovation may, however, be somewhat of a misnomer, since the appropriate behavior can be rather obvious to organizational participants (as well as to outside observers) and does not require any particular creativity. In these cases, the central question for research is not how a better procedure or solution can be invented, but why employees do not more often take action to correct an erroneous work role. Thus, we examined some causes of and impediments to task revision, with task revision defined as taking action to correct a faulty procedure, inaccurate job description, or dysfunctional role expectation.

To our knowledge, there has been practically no research on the problem of task revision in organizations. In what may be one of the few treatments of the issue, Hornstein argued that "in everyday experience, it comes down to a conflict between those folks who dutifully work to manage established routines in order to ensure the successful functioning of their organization, and those who courageously challenge routines in order to do the very same thing" (1986: 8). Hornstein interviewed people who took unpopular positions in their organizations. He found that courageous acts were

determined less by independence or self-reliance than by a sense of identification with the immediate task and a conviction that the facts, expertly interpreted by the individual, revealed what was right for the organization.

Theoretically, it would seem that individuals might have great difficulty revising tasks in organizations. The problem stems from the fact that most control systems are devoted to ensuring dependable work behavior structured according to the status quo, not change. For example, symbols of authority, rules, and penalties function to produce behavior modeled after those in power and their preferred modes of behavior. Monetary rewards and promotion systems likewise increase adherence to what is currently defined as correct or successful performance. And even goal setting, generally thought to be the most reliable technique for improving performance, may simply increase behavior in the prescribed direction. That is, when specific goals are set, an increase in the targeted behavior may come at the expense of more spontaneous or innovative actions. Thus, if task revision entails going around a job description or role expectations, it may be behavior with a low base rate.

Because task revision so often involves resistance to social norms and expectations, its analysis needs to draw on the conformity as well as performance literatures. Facing a misspecified task in a work setting is not unlike the typical situation in conformity experiments in which an individual has to stand up to group pressure, both real and imagined, in order to give an accurate response (Asch, 1955; Sherif, 1965). Being asked to perform a dysfunctional role also resembles situations in obedience research (Milgram, 1974) in which subjects receive orders from an authority figure to perform a task that violates their standards of behavior or ethics. Obedience studies have shown that individuals can easily become so absorbed in the narrow technical aspects of a task that they lose sight of its broader consequences. Therefore, acceptance of orders is not just a product of obeying an authority figure, but also part of the routine of a situation—part of the tacit assumptions accompanying a task role.

Breaking the expectations of others about how to perform a task may be difficult but not impossible. Milgram found, for example, that subjects administered fewer electrical shocks to others when an ordinary person rather than the experimenter gave the order to do so. Thus, the authority of those backing ineffective practices and routines may condition their acceptance. In a similar vein, small group research on social conformity has shown that confidence in their abilities can help sustain dissenters in the face of social pressures from others (Allen, 1965; Allen & Levine, 1971). Thus, any organizational practice or procedure that strengthens a person's knowledge of the correct way to accomplish a task or makes salient the superiority of personal knowledge may increase task revision. In contrast, any procedure that makes an organizational hierarchy or control system salient would be likely to inhibit changes in a work role.

Since research on task revision is in its infancy, we chose to study it through two interrelated laboratory experiments. Each experiment consisted

of a task simulation in which erroneous materials were presented to subjects as part of their work roles. Task revision was measured by the extent to which subjects changed these materials or replaced them with more appropriate task content. We manipulated several situational conditions to test for determinants of this alternative form of work performance.

EXPERIMENT 1

The hypotheses of the first experiment were fairly straightforward. Because people's knowledge base and confidence in their expertise have been found to temper compliance in social conformity studies (e.g., Geller, Endler, & Wiesenthal, 1973; Rosenberg, 1961) and were a recurrent theme in Hornstein's (1986) interviews on courageous behavior, we varied the salience of alternative task solutions. We hypothesized that the more salient individuals' own alternatives to erroneous task prescriptions are, the greater will be their efforts to improve upon a task. In contrast, when alternatives are not salient, people will tend to accept tasks that are even grossly in error. Thus,

> Hypothesis 1: The greater the salience of individuals' own solutions to a problem, the more task revision will be undertaken.

Since task revision involves correcting an error made by an employing organization or an immediate supervisor, we placed all subjects in a hierarchical situation. However, we varied the authority of those supporting the established procedure. As in the study of obedience, we hypothesized that the greater the authority of those fostering an erroneous procedure, the more difficult it would be for subjects to make changes in the task. Thus,

> Hypothesis 2: The higher the authority of those supporting an erroneous task, the less task revision will be undertaken.

Finally, because goal setting is currently the most accepted means of increasing job performance (Locke, Shaw, Saari, & Latham, 1981), we tested for the effects of specific goals upon task revision. We hypothesized that although goal setting may increase dependable work behavior, it might significantly inhibit task revision. Following the goal-setting literature, we compared the effects of specific goals with more general, "do-your-best" instructions. Thus,

> Hypothesis 3: The more specific the goal supporting an erroneous procedure, the less task revision will be undertaken.

Methods

The voluntary participation of undergraduate students taking introductory organizational behavior courses at the Haas School of Business, University of California, was sought for the first experiment. Instruments from 136 students were usable; 14 students chose not to participate in the exper-

iment or did not complete usable instruments. The research was character-
ized as an effort to sample students' writing in a work context rather than in
the usual term papers and examinations. Therefore, we asked subjects to
work on a "communications officer exercise " playing the role of a person in
charge of external communications for the business school. All subjects
worked on a promotional brochure that would be read by prospective stu-
dents applying to the school.

The salience manipulation. After presenting some general instructions,
we varied the salience of alternatives via the communications officer case.
For half the subjects the case primed the participants for content items that
they might subsequently use in the role-playing exercise. The case asked
subjects to think about characteristics of the business school and to rate 19
of its potential selling points as preparation for their work on the promo-
tional brochure. Subjects were asked to evaluate each feature in terms of its
appropriateness for the brochure in light of the nature of the school and the
characteristics of prospective students. The selling points subjects rated in-
cluded items that an earlier survey of Berkeley M.B.A. students had shown
to be strongly related to satisfaction, such as the reputations of the university
and the business school, the opportunity to secure a high-paying job, and
low tuition. The list of selling points also included several items specifically
designed to be perceived as negative features of attending Berkeley, such as
the availability of housing close to campus, the quality of the nearby Tele-
graph Avenue area, and the facilities of Barrows Hall, which houses the
business school.

The communications officer case. After subjects in the priming condi-
tion had rated the list of selling points, they continued with the role-playing
case. The unprimed subjects proceeded directly from the general instruc-
tions. All subjects then read a memo from the communications department
supervisor stating that the supervisor could not meet with the participant
because of a conference in San Francisco. However, while the supervisor
was away, the communications officer (or participant) was to work on a
revision of the promotional brochure. The memo explained that the bro-
chure was very important since it was the one on-going source of contact
between the school and student applicants. As part of the case materials,
participants received several pages from the school's most recent catalogue,
which included a general paragraph on the Berkeley campus, an explanation
of major areas of study, and course descriptions.

The supervisor's memo stated, "In revising the brochure, I'd like you to
start on the 'Qualities of the School' section. It is positioned as marked on the
enclosed copy of the brochure's written content." At this point, the contents
of the memo from the supervisor took two forms. For subjects in the *low
authority condition,* the memo read, "A draft of the revision is attached. This
section was written by a secretary who sometimes helps out when we are
short on staff." For subjects in the *high authority condition,* the memo read,
"A draft of the revision is attached. This section was written by the Associate
Dean."

Directly following the authority manipulation was the goal-setting induction. Subjects in the *specific goal condition* read, "This section was written by. . . . Check it out. I think that the paragraph needs some work. In fact, I think you really need to pay attention to transitions, subject-verb agreement, correct diction, and syntax—all those things we were taught in school but rarely practice. Please try to achieve these goals in your revision." In the *general goal condition*, subjects read, "This section was written by. . . . Check it out. I think the paragraph needs some work. Do your best on this."

The draft paragraph. The draft paragraph was the same for all the experimental conditions. Initially, we thought that a paragraph full of ideas ranked as moderately appropriate for the brochure would provide the greatest variance in task revision. However, pilot testing showed that, as in previous conformity studies (Jacobs & Campbell, 1961; Zucker, 1977), subjects had a strong tendency to use whatever model was provided to them. Therefore, in order to assure variance in the dependent variable (the amount of task revision), we constructed a draft paragraph with some very negative characteristics. The grammar and syntax of the paragraph were deficient in that there were many awkward and run-on sentences. More important, the paragraph included text about Barrows Hall, Telegraph Avenue, and the availability of housing as selling points. In fact, for several years the school has been trying to construct a new building because of the inadequacies of Barrows Hall; Telegraph Avenue, which is frequented by a very large number of homeless people and transients, is not viewed as attractive by most business school students; and finally, student housing is so scarce in Berkeley that signs offering rewards of up to $700 for information leading to the leasing of an apartment are common. Added to these negative features was a statement that the business school's staff values teaching over research, which contradicts a common student perception that Berkeley is mainly a research institution. The paragraph included only one valid selling point— an accurate sentence about the use of teaching evaluations at Berkeley. Thus, in addition to poor writing, the draft paragraph contained some very inappropriate content. The text of the draft paragraph follows:

> Nature or Qualities of the Berkeley Business School
>
> The University of California, Berkeley, is a good place to study business for several reasons. First, Barrows Hall, where all the classes are (except for a few) is a comfortable building where there are facilities for audio-visual displays, as well as small group discussions in addition to the usual lecture format for classes. Second, the renewed Telegraph Avenue area is an interesting environment to live in, with readily available modern and affordable housing for students. Third, the Business School program is taught by a staff that values teaching over research, as evidenced by the fact that annual awards are offered for the top graduate and undergraduate instructors and the fact that students help evaluate the performance of not only the younger faculty members but also those who are the most senior on the

staff. For these and other reasons, Berkeley stands out as one of the best business schools in the nation.

Dependent variables. The primary dependent variable was the degree to which subjects revised the content of the draft paragraph. Subjects were not specifically told to improve (or ignore) the content of the school description, but the inappropriateness of these task materials made it obvious that they could improve the content substantially. Each idea subjects used in their revisions of the draft paragraph therefore received a specific code. We coded the five ideas from the draft paragraph, all the items used in the priming manipulation, and several additional ideas that neither the draft paragraph nor the priming questionnaire contained, including references to computing facilities, library services, clubs, the curriculum, and the counseling and placement service. For each idea coded from the revised school descriptions, we noted whether the feature corresponded to the draft paragraph or represented an idea not part of the original draft. Thus, for each subject we calculated the total number of ideas included in the revision, the number of draft ideas, and the number of new ideas presented.

The coding of ideas from the revised school descriptions was relatively straightforward. Two coders, blind to experimental conditions, achieved an overall agreement of 92.8 percent across the various content items. When differences occurred, the coders resolved them with a coding they mutually agreed upon. It should be noted, however, that there was perfect coder agreement on each of the original draft items (Barrows Hall, Telegraph Avenue, housing, concern for teaching over research, and teaching evaluation). Thus, for the principal measure of task revision, deviation from the erroneous draft paragraph, there were essentially no problems of reliability.

A secondary dependent variable consisted of communication subjects conveyed to the supervisor about the writing task. After they had revised the school description for the recruiting brochure, subjects were asked to write a memo to their supervisor, Dale Williams. They were instructed to use the memo to explain what they did on the assignment or to convey any other information they might like to the supervisor. The instructions were intentionally general so that we could assess any objections to the task, calls for redirection, or rationales provided by the participant.

Control group. In addition to the eight experimental groups in the study, we randomly assigned 15 subjects to a control group. The control subjects received no priming, no draft paragraph written by a person of high or low authority, and no goal-setting induction. However, they did receive the same general instructions as the other subjects and the memo from the supervisor instructing them to write a paragraph describing the qualities of the business school for the recruiting brochure. Paragraphs from the control group were coded in the same manner as those from the other experimental groups.

Summary of the design. The design of the study was a two (priming vs. no priming) by two (low vs. high authority) by two (general vs. specific goal)

factorial experiment, with the addition of a single control group. Subjects were randomly assigned to all experimental conditions. Except for differences due to the manipulations, the experimental materials all subjects read were the same, and all answered the same postexperimental questionnaire containing manipulation check items.

Results

As noted, subjects in the priming condition rated 19 characteristics of the school for possible use in the promotional brochures. The list included four of the draft paragraph ideas. Because we obtained ratings from subjects in the priming condition before conducting any experimental manipulations, those ratings provided a basis for inferring the perceived merits of the draft paragraph. Table 1 shows the results of these ratings. As marked in the table, the quality of the Telegraph Avenue area, designed to be a low-rated item, was indeed the lowest rated characteristic on the list ($\bar{x} = 2.10$, one-to-nine scale). The availability and quality of housing, also believed to be a poor selling point, was one of the lowest rated items ($\bar{x} = 2.93$). The item in the draft paragraph on classroom facilities in Barrows Hall was rated 5th lowest on the list of 19 characteristics ($\bar{x} = 4.24$). Finally, concern of faculty for teaching over research, thought to be directly contrary to student beliefs at Berkeley, was scored near the midpoint of the scale ($\bar{x} = 5.74$) for appropriateness and ranked 12th out of the 19 items listed.

From the ratings in Table 1, we can reasonably conclude that subjects did not perceive the draft paragraph as containing correct selling points. The behavior of the subjects in the control group provides additional evidence of the inappropriateness of the draft paragraph. These subjects, who were simply instructed to write a paragraph on the nature of the school without seeing the draft paragraph, did not include any of the draft's content items.

Manipulation checks. On the postexperimental questionnaire, subjects completed four manipulation check items. One nine-point scale assessed whether subjects thought the content of the draft paragraph was appropriate or not. As expected, the primed subjects were less likely to agree with the statement "It was appropriate" than those in the unprimed condition (2.59 vs. 3.40, $t_{118} = 2.50$, $p < .01$). A second question, designed to assess the authority manipulation (secretary vs. dean), began, "The person who wrote the first draft had the following level of authority," followed by a nine-point response scale ranging from low to high. The mean for subjects told that the dean had written the draft was significantly higher than that for those told it had been a secretary (5.69 vs. 2.39, $t_{118} = 8.80$, $p < .001$).

Two questions designed to assess the goal-setting manipulation were "I was given specific directions on how to improve the paragraph" and "I was just given general encouragement on how to improve the paragraph," with responses ranging from "disagree" to "agree" on a nine-point scale. As expected, subjects given a specific goal reported receiving more specific directions than did subjects told to "do your best" (4.03 vs. 2.00, $t_{118} = 5.94$, $p <$

TABLE 1
Evaluation of Items' Appropriateness for Recruitment Brochure

Items in Order of Ranking	Mean Ratings[a]
Reputation of the graduate school of business administration	7.92
Reputation of the university as a whole	7.67
Personal learning and intellectual challenge	7.41
Contacts with Bay Area businesses	7.30
Training useful for long-term career mobility	7.08
Opportunity to do challenging work	7.00
Opportunity to secure a high-paying job	6.63
Association with intelligent and interesting fellow students	6.41
Tuition cost at public university	6.41
Bay Area activities and cultural diversity	6.29
Research reputation of the Berkeley faculty	5.88
Concern of faculty for teaching over research[b]	5.74
Highly theoretical orientation of education	5.71
Bay Area weather and natural beauty	4.97
Classroom and audiovisual facilities in Barrows Hall[b]	4.24
Practical applicability of coursework	4.03
Availability and quality of housing near the school[b]	2.93
Quality of fast food available from Sproul vendors[c]	2.24
Quality of Telegraph Avenue area[b]	2.10

[a] Subjects rated whether items were appropriate selling points on a scale ranging from 1 (minimum) to 9 (maximum).

[b] This item appeared in all draft paragraphs.

[c] This item appeared in the draft paragraph of experiment 2 only.

.001). However, the subjects did not differ on the general encouragement question (5.16 vs. 4.74, $t_{118} = 1.00$, n.s.]. It is therefore likely that subjects perceived a specific goal as involving general encouragement as well.

Effects on paragraph content. The number of draft ideas subjects could use in their revisions ranged from zero to five. As noted, four of these draft ideas (Barrows Hall, Telegraph Avenue, housing, and teaching over research) appeared in the priming condition's questionnaire; we added the fifth item (teaching evaluation) later when we found it possible to code for this feature on the dependent measure. Results showed that the experimental subjects used an average of 2.48 ideas from the original draft paragraph.

The second dependent measure was the number of new ideas used by subjects in their revised paragraphs. The average number of new ideas the experimental subjects used was 2.41, with a range of zero to nine across all conditions. Control subjects used an average of ≈.40 new ideas in their paragraphs.

Analyses of variance showed that priming had significant main effects on the use of both draft ($F_{1,117} = 23.37$, $p < .001$, $\omega^2 = .15$) and new ideas ($F_{1,117} = 21.89$, $p < .001$, $\omega^2 = .15$). There were also main effects of goal setting on the use of both draft ($F_{1,117} = 18.80$, $p < .001$, $\omega^2 = .12$) and new ideas ($F_{1,117} = 5.78$, $p < .05$, $\omega^2 = .04$). However, authority had no effects on

the use of either draft $(F_{1,117} < 1.00]$ or new ideas $(F_{1,117} < 1.00)$. Significant interactions of the independent variables occurred on neither the draft nor the new ideas measure.

As an inclusive measure of task revision, we also calculated the number of *net ideas* each subject offered. Net ideas was operationalized as the number of new ideas—those not mentioned in the draft paragraph—minus the number of inappropriate ideas retained from the original draft. The inappropriate ideas used in this inclusive measure were the three most negatively rated items: references to Telegraph Avenue, the availability of housing, and Barrows Hall. Net ideas thus captured the nature of task revision by assessing both adherence to existing, poorly rated content and the introduction of new material into the task.

Figure 2 shows the cell means for net ideas in each experimental condition. As in the earlier analyses, priming had a significant main effect $(F_{1,117} = 26.97, p < .001, \omega^2 = .17)$ as did goal setting $(F_{1,117} = 10.65, p < .01, \omega^2 = .07)$, but authority did not $(F_{1,117} < 1.00)$. No differences in the strength or pattern of these results emerged when we analyzed the components of the net ideas measure separately. And as before, priming, goal setting, and authority had no significant interactions.

Effects on memos to the supervisor. Only 88 of the 121 experimental subjects completed memos to the supervisor. Subjects were not instructed that it was mandatory to complete such memos, and the instructions simply described the memo as a way "to convey any information one might like" to the supervisor. The most frequently coded responses on the memos were simple descriptions of revisions to the draft paragraph; 46 of the 88 memos

FIGURE 2
Experiment 1: Net Ideas by Condition
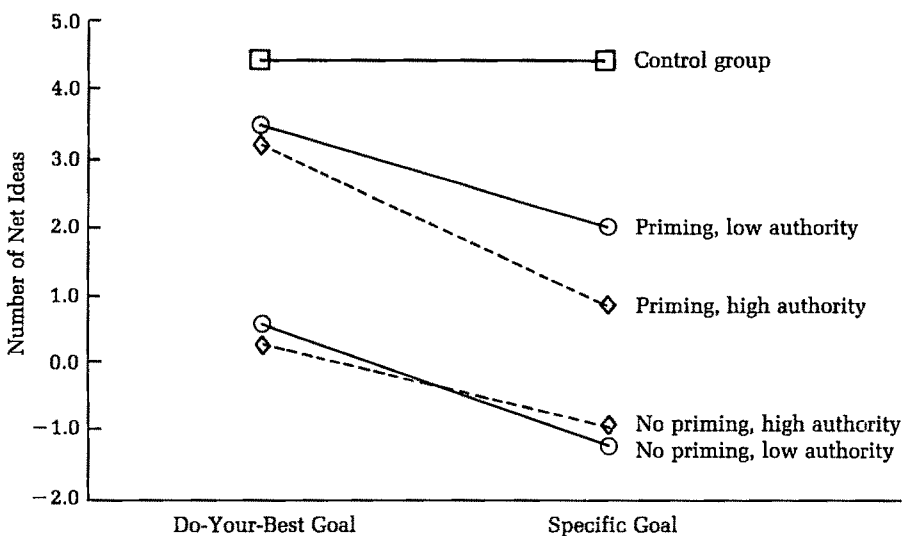
contained such descriptions. In addition, 33 subjects gave reasons for their revisions, 35 voiced objections about the content of the draft paragraph, 28 complained about the grammar of the paragraph, and 18 requested a meeting with the supervisor. Nineteen subjects conveyed some approval of the draft paragraphs and 7 used the memos for ingratiation with the supervisor. Of the coded responses, only three varied significantly with the experimental manipulations. Subjects in the priming condition were more likely to describe revisions to the paragraphs [$\chi^2(1, N = 88) = 10.47, p < .001$] and to explain the reasons for their revisions [$\chi^2(1, N = 88) = 6.14, p < .05$] than participants in the no-priming condition. In contrast, subjects in the no-priming condition were more likely to complain about the grammar of the draft paragraphs [$\chi^2(1, N = 88) = 13.64, p < .001$] than subjects who had been primed with possible selling points for the school.

Discussion

The results supported two of the three hypotheses investigated by the study. The priming manipulation tested whether increasing the salience of alternatives would increase task revision, and salience indeed had a strong effect on the content of task paragraphs. The goal-setting manipulation tested whether having specific directives would decrease task revision, and as expected, subjects with specific goals made fewer content changes than those who received general instructions to do their best. The authority manipulation tested whether revision would decrease when an existing procedure was said to be backed by someone with higher authority. Authority had no effects on the content of task paragraphs.

Priming. We can infer that most subjects did not approve of the draft paragraph's content, given the low ratings of the content items shown in Table 1 and their lack of use by control subjects. Yet, when confronted with a model, even one that was clearly erroneous, subjects tended to be influenced by its content. Although the priming manipulation mitigated this task conformity, it also highlighted the low base rate of task revision in work settings. Without priming, subjects used most of the ideas ($\bar{x} = 3.18$) from the draft paragraph. Subjects even used over half ($\bar{x} = 1.95$) of the three worst ideas contained in the draft paragraph (Telegraph Avenue, availability of housing, and Barrows Hall), although these items were almost universally disapproved as selling points. Therefore, subjects who did not have some sort of priming—which literally forced them to list a better alternative— achieved very poor performance on the task.

Unfortunately, most real-life settings do not include specific encouragement for alternative approaches, and may even tacitly discourage such thoughts. Natural settings also do not usually include task models that are as blatantly false or undesirable as the draft paragraph used in this study. Thus, the low level of content change in the no-priming condition is probably typical of conformity in natural work environments, where existing task formulations become accepted and even institutionalized over time (Zucker,

1977). The priming manipulation simply demonstrated the potential of one possible intervention to increase revision in erroneous task situations.

Goal setting. Goal-setting effects have been widely hailed as one of the most robust findings in the behavioral sciences (Locke et al., 1981) and as one of the few unconditionally positive interventions for improving work performance. However, we found that a specific goal of improving the grammar of a task paragraph was associated with the lowest performance in terms of content improvement. Focusing on the grammar seemed to impede awareness of rather obvious improvements needed in the message itself. For example, when subjects had a specific goal but no priming for alternatives (arguably a very typical situation in organizations), they kept the bulk of the draft ideas—a mean 3.73 out of a possible five items—as well as most of the three worst content items ($\bar{x}$ = 2.33). Subjects told to do their best used fewer draft ideas ($\bar{x}$ = 2.55) and fewer of the poorest content items ($\bar{x}$ = 1.52).

It could be argued that our goal-setting manipulation differed from those usually carried out in research on work performance. In most goal-setting studies a specific goal is operationalized by a quantitative target for performance, such as assembling so many parts per hour or cutting a certain volume of logs (e.g., Latham & Yukl, 1975). In contrast, this study presented subjects with the goal of improving the grammar of a task paragraph, since we thought asking them to find a specific number of grammatical errors would have appeared highly artificial in a simulation of administrative behavior. No doubt, if we had specified a target level for the number of grammatical errors to be corrected, this would have constituted a more concrete goal than our simple behavioral directive. As a result, the differences shown between this study's specific and general goal conditions may understate the goal-setting effects. With a stronger goal-setting manipulation, greater undermining of task revision would be likely.

EXPERIMENT 2

The most important results to come out of the first experiment were (1) that the salience of alternatives increased subjects' efforts to revise a faulty task and (2) that having a specific goal detracted from such efforts. The salience effect is understandable in light of previous work on conditions that facilitate nonconformity in social situations. However, because the goal-setting effect differed so sharply from findings in the rest of the goal-setting literature, we felt it deserved further attention.

Goal-setting revisited. An ardent defender of goal setting might argue that the principal finding of experiment 1 was not that goal setting did not work, but that the goal was misspecified in the study. We essentially agree with this position, yet with a caveat. The major point of the research was not to deny the oft-replicated effects of goal setting (Locke et al., 1981) but to show how control mechanisms can suppress one form of useful counter-role behavior. Motivating behavior in a prescribed direction may reduce a potential source of work adaptiveness.

Except on very simple tasks, where the path for correct behavior is self-evident, it is often unclear where the optimal direction of behavior lies. Thus, the notion that goals need to be "correctly" specified is based on the fundamental assumption of hierarchical and prescient knowledge—that those in command know best where efforts should be placed. The rub, of course, is that such confidently prescribed behavior may actually be in error, since workers can often know more than a supervisor about the proper course of action (Mechanic, 1962), and because behavior that is currently thought to be optimal may in fact be dysfunctional for longer-run effectiveness (Katz & Kahn, 1978).

In order to illustrate the effects of goal specification, we compared a goal for content improvement to both the general do-your-best instructions and the goal of reducing grammatical errors used in the prior study. Content changes were expected to vary directly according to the direction of the goal, with the *content-specific goal* positively influencing task revision, the *grammar-specific goal* negatively affecting such changes, and *do-your-best* instructions producing effects between these two extremes. Thus,

> Hypothesis 4: A specific goal will suppress task revision, unless task revision is part of the goal itself.

Hierarchical roles. In addition to clarifying the goal-setting effects, we also believed it worthwhile to explore further the impact of authority on task revision. Although it is possible that authority simply has little effect on this form of performance, we thought it prudent to examine another formulation of the construct before ruling out such influences. Perhaps we found no authority effects in experiment 1 because we manipulated authority by altering message credibility rather than the role relationships inherent in the authority construct. A stronger manipulation might emphasize whether task participants were in a supervisory or subordinate role, receiving information from someone directly above or below them in a hierarchy. Thus, we altered the experimental materials so that half our subjects received inappropriate task material from someone reporting to them while the other half received the task materials from their supervisor, as in the previous experiment. Hence,

> Hypothesis 5: Task revision will be greater when an individual is in a supervisory rather than a subordinate position.

Accountability. Whatever the position a person occupies in a hierarchy, a major consequence of role taking is the evaluation of performance by others. Even those in charge of an office, department, or organization are accountable to other organizational constituents (Pfeffer & Salancik, 1978). Tetlock (1985) argued that being accountable to others can significantly reduce errors in information processing and increase decisional accuracy. We predicted, however, that accountability might have a more complex effect on task revision, depending upon whether subjects occupy a supervisory or subordinate position. When a person is in a supervisory position, in charge of the quality of a product, making revisions in task materials and proce-

dures is an expected part of the work role. As a consequence, accountability would likely serve to heighten the level of task revision by supervisors. In contrast, people in subordinate roles typically do what they are told. Hence, an increase in accountability for subordinates might make salient the necessity of compliance and suppress task revision. Thus,

> *Hypothesis 6: Accountability and hierarchical role will interact, with accountability increasing task revision for individuals in supervisory roles but reducing it for those in subordinate positions.*

Methods

Subjects were 149 undergraduate students taking introductory organizational behavior courses at the University of California, Berkeley. Participation was again voluntary, with 12 students choosing not to participate or turning in unusable responses. None of these subjects had participated in or discussed experiment 1. The basic design of this second experiment was a two-by-two factorial with hierarchical role and accountability crossed. We also added two additional cells to form a one-by-three test of the goal-setting variable, employing one of the cells from the two-by-two design. Subjects were randomly assigned to experimental conditions.

All subjects were asked to participate in a job simulation exercise, which was described as part of an effort to develop measures of behavior in realistic work situations. As in the first experiment, students were asked to play a communication role, writing a portion of the promotional brochure for the undergraduate business program.

Hierarchy and accountability manipulations. The hierarchy manipulation was accomplished by having subjects study one of two formats of the role description. In the *subordinate condition*, subjects were asked to place themselves in the role of a communications officer in the business school. In the *supervisor condition*, subjects were asked to put themselves in the role of director of communications, in charge of various communication functions for the school. The two role descriptions, shown below, were the same except for the variations indicated by the words in the brackets.

<div align="center">

The Role of Pat Fisher,
Communications Officer [*Director of Communications*] in the
School of Business Administration

</div>

> Imagine yourself in the role of Pat Fisher, who is a *Communications Officer* [*Director of Communications*] in the Berkeley Business School. This job concerns all aspects of communication with various constituents of the School: prospective students, alumni, the city of Berkeley, the State, and the general public. You *are not* [are] in charge of any [all] of these functions, but [and] the tasks you perform in these areas are important to the welfare and effective functioning of the School.
>
> As Pat Fisher, assume that you have so far been successful on all of the jobs assigned to you as a communications officer

[*director of communications*] for the School. However, today
your *supervisor* [*one of your subordinate staff*], Dale Williams,
has just left you a memo concerning a special task that needs to
be done.

For those in the *high accountability condition*, the directions concluded
with the following paragraph:

Keep in mind that you will soon be given an annual performance
evaluation. The performance evaluation will determine your
level of pay for the following year as well as your chances for
promotion in the University. Since you report directly to the
Director of Communications [*Dean*] of the Business School, *Dale
Williams* [*he*] will be responsible for your annual review.

Those in the *low accountability condition* received no such paragraph of
instructions.

As in the previous experiment, all subjects received a memo from "Dale
Williams" stating that Williams was participating in a conference in San
Francisco and needed some help on the school's promotional brochure. For
those in the *subordinate condition*, Williams was Fisher's direct supervisor.
Williams instructed Fisher that all that needed to be finished on the bro-
chure was the "Qualities of the School" section and enclosed a draft written
by one of the staff. The memo concluded, "I'm sorry to impose upon you in
getting this material out so soon. I appreciate your help on this."

For those in the *supervisor condition*, the memo to Fisher was exactly
the same but mentioned that it was very unusual for an employee to give
instructions to a supervisor. Thus, it ended, "I'm sorry to impose upon you
in getting this material out so soon. I realize that I'm supposed to be working
for you rather than adding to your supervisory workload. I appreciate all
your help on this."

Goal-setting manipulation. All subjects in the four experimental condi-
tions crossed by hierarchy and accountability received specific goal-setting
instructions. As in the previous study, the subjects were instructed (via the
memo from Williams) that the grammar of the draft paragraph needed atten-
tion, without mentioning the paragraph's content. Thus, goal setting was
held constant for the tests of hierarchy and accountability.

For the test of goal setting, we added two cells to the design. Subjects
randomly assigned to the *content-specific condition* were told in the memo
from Williams, "In fact, I think we really need to pay attention to the ideas
we present as selling points. The content should accurately describe positive
features of the School which would be of interest to prospective students. I
believe we need to achieve these goals in the revision." In the *do-your-best
condition*, subjects were simply told, "We really need to do the best job we
can in revising this material." For consistency with the previous experiment,
these two cells were run with subjects playing the role of a subordinate and
without any additional material on accountability. The *content-specific* and

do-your-best conditions could thus be compared statistically with the *sub-ordinate-low accountability* cell of the two-by-two design, since this latter cell was a *grammar-specific* condition equivalent to the others in all ways except the goal-setting treatment. The experiment thus provided a one-by-three test of goal setting comparing *content-specific, grammar-specific,* and *do-your-best* conditions.

Dependent variable. For experiment 2 we made some minor changes to the draft paragraph, the most important of which was the addition of another inappropriate idea. Proximity of the school to food vendors on Sproul Plaza was added to the draft paragraph to increase variance on the dependent variable. Results from the priming questionnaire in experiment 1 showed that students gave this idea the second lowest rating as a selling point for the business school. Thus, to calculate net ideas, we subtracted the number of references to the availability of housing, Telegraph Avenue, Barrows Hall, and food vendors from the number of new ideas subjects suggested.

As in the first experiment, ideas were coded into various topic categories, with an overall agreement of 94.6 percent between two coders blind to subjects' experimental conditions. The coders resolved any differences by mutual agreement. However, as before, there were no errors in coding any of the draft items.

Results

A postexperimental questionnaire administered to all subjects in experiment 2 contained several manipulation check items. Two items assessed the strength of the hierarchy manipulation. Subjects responded on a nine-point scale, on which nine equaled full agreement, to questions asking whether "my subordinate, an assistant communications officer," or "my supervisor, the Director of Communications in the School," had written the memo. The items had an appropriate negative correlation ($r_{147} = -.84$, $p < .001$). Subjects in the supervisor condition had a mean significantly higher than those in the subordinate condition on the first item (8.15 vs. 1.45, $t_{147} = 24.14$, $p < .001$), and a significantly lower mean on the second item (1.33 vs. 7.91, $t_{147} = 19.42$, $p < .001$).

To check on the accountability manipulation, subjects responded to two questions (again on nine-point scales): "I was told that I would soon be given a performance evaluation determining my level of pay and chances for promotion" and "I do not recall being told anything about an upcoming performance evaluation." The correlation between the questions was $-.70$ ($p < .001$). Subjects in the high accountability condition had a mean significantly higher on the first question (7.24 vs. 1.18, $t_{147} = 20.86$, $p < .001$) and significantly lower on the second question (1.82 vs. 8.07, $t_{147} = 15.95$, $p < .001$) than those in the low accountability condition.

Three questions assessed the effectiveness of the goal-setting manipulation. As in the first experiment, subjects were asked to indicate their agreement (on nine-point scales) with the following statements: "I was given

specific directions to improve the content of the paragraph," "I was given specific directions to improve the grammar of the paragraph," and "I was only told to 'do my best' in improving the paragraph." All means differed significantly by experimental condition: those in the grammar condition scored higher than those in other cells on the grammar question (7.03 vs. 1.92, t_{147} = 15.11, p < .001). Similarly, those in the *content* condition scored higher than those in other cells on the content question (6.36 vs. 4.06, t_{147} = 4.11, p < .001); and those in the *do-your-best* condition scored higher than the others on the do-your-best question (7.48 vs. 5.07, t_{146} = 4.09, p < .001).

Effects on paragraph content. As in experiment 1, we calculated the use of draft ideas, new ideas, and net ideas. Figure 3 shows the cell means for the number of net ideas in the six experimental conditions. For the two-by-two factorial, there were no significant main effects for the hierarchical role manipulation ($F_{1,95}$ = 0.98, n.s.) or the accountability treatment ($F_{1,95}$ = 1.17, n.s.). However, as predicted, there was a significant interaction of hierarchy and accountability ($F_{1,95}$ = 6.83, p < .01, ω^2 = .07). Also as expected, the results of the one-by-three test of goal setting were significant, with members of the content goal condition showing the most net ideas and those in the grammar goal condition the fewest ($F_{2,72}$ = 6.81, p < .01, ω^2 = .16). This same pattern and strength of results emerged with either number of draft ideas or number of new ideas as the dependent measure.

As Figure 3 illustrates, accountability had differential effects on net ideas according to whether subjects were in a supervisory or subordinate role. As predicted, when subjects acted as supervisors, accountability in-

FIGURE 3
Experiment 2: Net Ideas by Condition
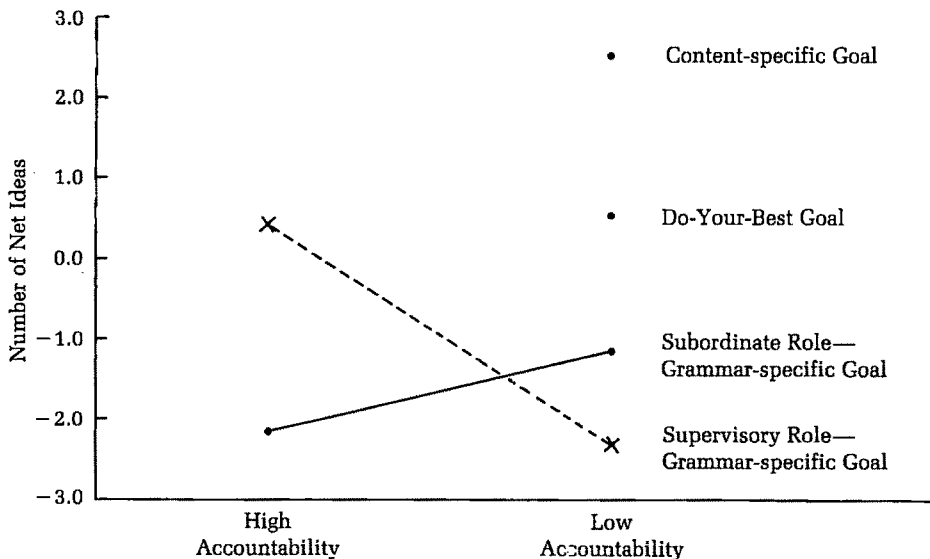
creased their level of task revision (.42 vs. -2.29, $t_{46} = 2.53$, $p < .05$). However, when subjects were in a subordinate role, there was a nonsignificant decrease when accountability was heightened (-2.15 vs. -1.12, $t_{49} = t = 1.08$, n.s.). The performance of supervisors under the high accountability condition was similar to that of the do-your-best subjects ($-.42$ vs. $-.56$), even though the accountable supervisors had to cope with the erroneous grammar-specific goal. Subordinates in the high-accountability and supervisors in the low-accountability condition both exhibited significantly fewer net ideas than those in the do-your-best condition (-2.15 and -2.29 vs. .56, $t_{49} = 2.58$, $p < .01$ and $t_{49} = 2.69$, $p < .01$). The content-specific condition differed significantly from each of the four grammar-specific conditions in the experiment, with t's ranging from 2.10 to 5.28. Subjects in the content-specific cell and the do-your-best condition also differed in the number of net ideas exhibited (2.56 vs. .56, $t_{48} = 1.98$, $p < .05$).

Discussion

The data from the second experiment help clarify and extend previous findings. In terms of goal setting, experiment 2 illustrates how the direction of a specified goal can influence task revision. As expected, when the goal was specified for correction of task content, subjects indeed improved the content. When the goal was inappropriately specified for grammar, subjects made few content changes. Do-your-best instructions produced results between these two extremes.

In terms of supervision, we found that putting people in charge of a function and making them accountable for its results fostered task revision, but adding evaluation pressures to a subordinate's duties only suppressed such changes. These results imply that accountability does not have a uniformly positive effect on individual performance in work situations. Accountability may spur task behavior, but in a way that intensifies the existing direction of a work role. Supervisors under accountability pressures may take on a heavier burden to achieve an appropriate product, but subordinates may only narrow the scope of their activities. Thus, it could be argued that efforts to increase performance should be directed toward both accountability and empowerment, emphasizing both the potential influence of employees as well as their responsibilities for task accomplishment.

GENERAL DISCUSSION

The results from the two experiments have some broad implications for the performance literature. Perhaps the most important finding was the generally low base rate of task revision. Despite efforts to include strongly disapproved content in the task and to make the task relevant and realistic to subjects, the most general response was to accept erroneous content. This data pattern became obvious to us as we first pretested materials for experiment 1, and was reinforced as we made the task increasingly negative to

provide variance on the dependent variable. Of course, we found in experiment 1 that it was possible to increase task revision by priming subjects with "correct" answers, and in experiment 2 we learned that establishing goals for the "right" response increased task revision. However, these effects do not dispel our anxiety over the natural or baseline response of individuals without such prodding. Like the Milgram (1973) studies, these experiments should alert us to the generally high level of acceptance or conformity that may underlie work performance.

Despite the low base rate of task revision, the two experiments showed that it is possible to reduce this aspect of performance even further. In fact, it appears that common control mechanisms like goal setting can actually drive out what little tendency toward task revision naturally exists. The initial results of experiment 1 made this problem appear to be an issue of specific versus general goals. The inclusion of both grammar- and content-specific goals in experiment 2 helped point to some broader dimensions of the problem, however. The results of the second experiment underscored the superiority of a correctly specified task goal. Thus, if an organization's management is virtually certain of the appropriate direction for behavior and employees' inputs will not inform such direction, the specification of goals by a supervisor will be in order. However, if a task involves uncertainty and lower-level participants are potentially a source of useful information (Mechanic, 1962; Vroom & Yetton, 1973), general instructions to employees to do their best may be more appropriate. Though general goals are not as effective as those that are correctly specified, they are clearly superior to specific yet incorrect goals. Because they preserve an individual's own perspective on a task, do-your-best instructions may therefore be quite functional when a task is highly complex or necessitates innovation over time.

Not surprisingly, research has started to isolate task complexity as a possible moderator of goal-setting effects (Wood, Mento, & Locke, 1987). For example, Huber (1985) argued that goal setting is best suited to algorithmic tasks in which a correct strategy is relatively obvious, as opposed to heuristic problems in which it is difficult to specify methods for solution. Because goal setting was found to contribute to arousal, Huber noted that it could contribute to the dominance of well-learned responses or cognitive fixedness in a problem situation (cf. Zajonc, 1965). Along similar lines, Earley, Connolly, and Ekegren (1987) found that on a complex task (in which the correct strategy was not apparent) do-your-best instructions were more successful than a specific goal. Earley and colleagues summarized these effects by noting that goal setting may not be useful when (1) performance is more a function of strategy than of task effort, (2) there are many available strategies, and (3) the optimal strategy is neither obvious nor readily available.

Our experiments on task revision highlight a potential problem for goal setting that may be even more serious than the possible inhibition of performance on ambiguous or complex tasks. Goal setting is not only a means of energizing behavior and activating strategies for the performance of a task; it is an obvious and powerful way of directing employee behavior. Just like

socialization and incentive systems, goal setting informs the individual about what behavior is valued and appropriate. Unfortunately, as we argued earlier, what supervisors or higher management desire may be dysfunctional or incorrect from a broader organizational perspective. In an observation about how to manage the military, Admiral Hyman Rickover captured this argument most eloquently when he noted: "Subordinates are needed who are committed to goals rather than process and who are not afraid to criticize when they no longer agree with the goals. . . . What is required is someone to disturb the self-assurance of a staff. Someone who will say, 'We are getting into a mess'!" (Hornstein, 1986: 142.) Thus, we are reminded how important it is to preserve the individual's own perspective as a source of task revision. We are also reminded that if a prescribed direction of activity is in error, adding an extra source of influence may only compound the problem (cf. Kerr, 1975).

Future Directions

Given the rudimentary state of our knowledge of task revision, how should research proceed on the issue? One path might be to investigate organizational conditions that foster courageous and even deviant behavior. For example, having social support for deviation, insurance against termination of employment, and a cohort of like-minded dissidents could facilitate many counter-role behaviors, including task revision. In contrast, tight controls, the enforcement of social norms, and a strong organizational culture might all inhibit alternative work behavior. Especially important may be the degree of downside risk that those who revise or redirect their work roles might incur. As Kanter (1977) noted, firms with a heavy emphasis on upward mobility coupled with ambiguous criteria for promotion may exert the strongest forces for conformity, because of the riskiness of personal failure in such organizations.

Common work practices could also be candidates for research on task revision. Just as goal setting has been found to potentially inhibit change, so too may other motivation schemes, such as piece rates and gain-sharing, that focus or channel work behavior. Detailed job descriptions and the coordination of central planning could likewise serve to strengthen consensual ideas about work procedures and make them less subject to change. In contrast, candidates for increasing task revision might be job enlargement and work participation schemes, since they may heighten responsibility and empowerment in employment settings. Though the effects of participation in goal setting have been mixed (Locke & Schweiger, 1979), most analysts have looked at whether participation motivates or stimulates task performance, as defined by the supervisor. Not yet examined is the effect of participation on the direction of performance—the choice of tasks to be undertaken and the methods to be used for their attainment.

Finally, although we have only presented situational data here, it is possible that personality determinants could predict task revision. Some likely candidates might include willingness to stand up to authority, self-

monitoring, self-esteem, and independence. It should be noted, however, that personality research on task revision should be conducted as a primary endeavor rather than as an extension to experimental studies, as has been common (cf. Weiss & Adler, 1984). Ideally, such research would use multiple measures (e.g., questionnaires, interviews, and observation) and would address some of the situational characteristics moderating the strength of personality influences. For example, it is possible that personality measures will only predict task revision when situational constraints against counter-role behavior are relaxed (cf. Monson, Hesley, & Chernick, 1982). Since bucking role expectations and supervisory orders is so difficult, it may be that personality variables are only relevant to task revision when other facilitating forces, such as social support, are present in the situation.

Variations in Counter-role Behavior

An alternative direction for research would be to focus on the etiology of various forms of counter-role behavior. Counter-role behaviors can take many shapes other than the revision of task content. They can come in the form of inquiries about procedures and objectives, suggestions for improvement, negotiation of duties, lobbying within an organization, protests to higher authorities, and whistle-blowing. Except for research on whistle-blowing (e.g., Graham, 1986; Near & Micelli, 1987) and some sociological studies of collective action (e.g., Thomas, Walker, & Zelditch, 1986; Zald & Berger, 1978), there has been little work on either the causes or consequences of counter-role behavior.

There has also been little specification of the process by which counter-role behavior might influence broader organizational outcomes. However, research on minority influence offers an interesting lead on this issue. In several studies, Nemeth and her colleagues found that exposure to a dissenting minority can affect the decision style of individuals, even if the minority does not overtly persuade them (Nemeth & Kwan, 1985; Nemeth & Wachtler, 1983). The presence of a dissenting minority apparently leads individuals to attend to more aspects of a decision and to reexamine its premises. In contrast, individuals exposed only to majority views tend toward convergent thinking and unreflective acceptance of prevailing ideas (Nemeth, 1986). Thus, we might argue that counter-role behavior is important for more than the changes introduced by individuals working on their own tasks. Counter-role behavior can have an indirect influence causing others in an organization to reconsider their work activities over time. Like minority influence, counter-role behavior may work slowly and indirectly to broaden the perspective of an organization.

Conclusions

Task revision is an important dependent variable that previous research on work performance has not adequately addressed. We therefore designed two experiments to measure this construct and demonstrate several of its

determinants. Our discussion of the experimental results and their implications has been broader than that of most empirical studies, since research on the topic of task revision and other forms of counter-role behavior is in its infancy. The point of this analysis has not been to prescribe a precise path for future research but to demonstrate the possibilities of such work.

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PREDICTING SOCIAL-SEXUAL BEHAVIOR AT WORK: A CONTACT HYPOTHESIS

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This study explored two competing hypotheses about social-sexual behavior at work, which we defined as any non–work-related behavior having a sexual component, including harassment, flirting, and making sexual jokes. The "contact hypothesis" suggests that reports of sexual harassment, nonharassing sexual behavior, and the sexualization of a work environment are associated with the amount of contact individuals have with members of the other gender at work. In contrast, the "gender hypothesis" suggests that men will initiate more and women report more social-sexual behavior, independent of contact. Data from 1,232 men and women provided some support for each perspective. Nonharassing sexual behavior was related to the amount of contact people had with the other gender; men and women were equally likely to report such behavior. Sexual harassment and environmental sexualization, however, were related to both contact and gender.

Social-sexual behavior at work is considerably more common than textbooks and academic examinations of work behavior have led their readers to believe. Social-sexual behavior is any non–work-related behavior having a sexual component; it includes sexual harassment, initiating dating, flirting, and the like. Although prior to the late 1970s there was virtually no mention of social-sexual behavior at work in textbooks or research literature (Burrell, 1984; Gutek, 1985; Gutek & Nakamura, 1982; Hearn & Parkin, 1987; MacKinnon, 1979), researchers now know that such behavior is quite common. Analyses of office romances (e.g., Quinn, 1977; Wall St. Journal, 1981) and sexual harassment (Gutek, Nakamura, Gahart, Handschumacher, & Russell, 1980; Schneider, 1984; Tangri, Burt, & Johnson, 1982) have suggested that over half of all employees have received some kind of sexual overture or comment from a co-worker of the other gender and about 10 percent of all women have quit a job because of sexual harassment (Gutek, 1985; Gutek et al., 1980).

Although much previous research has focused on social-sexual behavior directed at individuals (e.g., Abbey, 1982; Quinn, 1977; Saal, 1986), some research has examined work environments for forms of social-sexual behavior not directed at any particular individual. These forms include displaying sexually explicit pictures and telling sexual jokes to groups (Gutek & Dunwoody, 1987; Hearn & Parkin, 1987; Sheppard, 1989). Researchers have considered offensive forms of such sexualization of a work environment as sexual harassment (Gutek, 1985; Sheppard, 1989; Schneider, 1984; Tangri et al., 1982), as do the current guidelines of the Equal Employment Opportunity Commission (EEOC), sometimes referred to as the polluted work environment clause. If jokes, comments, or the general ambience of a work place create a hostile or offensive environment, an employer can be found guilty of sexual harassment. Thus, a definition of social-sexual behavior at work that is broad enough to encompass all conditions of sexual harassment under the EEOC's definition includes sexualization of a work environment as well as direct social-sexual behavior.

A broad definition also includes nonharassing behavior, such as making sexual comments intended to be taken as complimentary, attempts to initiate dating, flirting, presenting sexually oriented jokes or cartoons, wolf whistling, and making sexual comments that are mildly annoying but not offensive enough to be labeled harassment. In general, however, sexual harassment, not nonharassing sexual behavior, has received the lion's share of attention. Perhaps sexual harassment has caught the public's imagination because it creates legal liability whereas other social-sexual behavior does not. Nonharassing sexual behavior has been assumed to be more benign in its effects and to have fewer legal consequences than sexual harassment; it has therefore received little attention (Gutek & Dunwoody, 1987; Schneider, 1984). Since nonharassing sexual behavior is more common, however, it may be more important for understanding men's and women's behavior at work. Accordingly, we focused on the full range of social-sexual behavior at work: direct harassment, direct nonharassing behavior, and sexualization of a work environment.

PREDICTING SOCIAL-SEXUAL BEHAVIOR AT WORK

There is no commonly accepted framework for studying social-sexual behavior at work. Probably the most common lay view of nonharassing sexual behavior is that sexual interest prompts it: men and women make overtures at work because they are attracted to each other (Gutek, 1985: 12–18; Tangri et al., 1982). On the other hand, people are likely to view sexual harassment as an exercise of power rather than of sexual interest. Not surprisingly, in previous research a common post hoc explanation for sexual harassment has been that it constituted one person's exercise of power over another and was an outcome of a male-oriented (i.e., patriarchal) society (e.g., Betz & Fitzgerald, 1987; Collins & Blodgett, 1981; Deaux & Ullman,

1983; Gutek, 1985; Schneider, 1984; Tangri et al., 1982). The exercise of power has not, however, figured as an explanation for work environment sexualization or nonharassing sexual behavior (cf. Gutek & Morasch, 1982; Quinn, 1977). Thus, researchers have viewed different social-sexual behaviors as having different causes. Although this position is reasonable, it also seemed reasonable to look for common antecedents or causes of all social-sexual behavior at work. One possible common antecedent that researchers have overlooked is the simple amount of contact individuals have with members of the other gender at work.

The Contact Hypothesis

The hypothesis that contact accounts for social-sexual behavior at work is compelling in that it is parsimonious, general, commonsensical, predictive, and perhaps explanatory of many extant findings in the literature. Contact, which has been studied as both an independent and a dependent variable, has roots in sociology and social psychology, and its importance is implicit in several streams of research in organizational behavior. For example, Homan's sociological theory predicted a positive relationship between the frequency of interaction or contact between two people and the amount of liking they have for one another (1950: 110–113). Social psychologists, too, have studied contact, finding repeatedly that increased contact with other people (Rubin, 1973: 113–133) or with such objects as written "Chinese characters" (Zajonc, 1968) will increase how much individuals like them.

Blau (1977) made various predictions about contact between groups on the basis of group composition. He was interested in predictors of contact and used contact as both a dependent and an independent variable. On the basis of his "primitive theory of social structure," Blau predicted, for example, that "for any dichotomy of society, the small group has more extensive intergroup relations than the large" (1977: 42) and "increasing status diversity increases the probabilities of associations among persons whose status differs" (1977: 82). In support of those hypotheses about contact, Blau, Blum, and Schwartz (1982) found that as the ethnic heterogeneity of a census tract increased, the probability of intermarriage between ethnic groups increased—presumably because the amount of contact between ethnic groups increased, setting up conditions for liking and marriage.

Recent research and theories on group composition (partially reviewed by Konrad and Gutek, 1987) and on organizational demography (e.g., Pfeffer, 1983; Tsui & O'Reilly, 1989) have been influenced by Blau and are obviously relevant to contact. The demographic mix of employees in an organization will affect the amount of contact that occurs within and across categories defined by age, race, and gender. In another area of research within organizational behavior, Terborg and Ilgen (1975) and Nieva and Gutek (1980) concluded that people judging another's performance stereotype less during

performance appraisals, which imply prior contact between judge and ratee, than during selection, which involves little contact prior to judging.

Although much of the extant research has focused on positive consequences of contact, some research has found negative consequences, suggesting that perhaps a high amount of contact between groups creates strong feelings—both positive and negative. For example, Sampson (1984) found that intergroup victimization was higher where race and age were more heterogeneous, leading to a high level of interrace and interage contact.

In the case of social-sexual behavior, an individual's contact with the other gender seems to be a limiting condition. A woman cannot be propositioned by a man at work unless she comes into contact with at least one man. The more men she comes into contact with at work, the more likely it is that she will be propositioned by a man or hear a man tell sexual jokes. Likewise, the contact hypothesis suggests that the more contact with women a man has at work, the more likely it is that he will be the target of sexual harassment or sexual comments from women.

The contact hypothesis can account for some findings regarding social-sexual behavior at work, especially sexual harassment, which has been studied more than other social-sexual behavior. For example, researchers have found that women in nontraditional jobs, that is, jobs in which men vastly outnumber women in their job category, are especially likely to be sexually harassed (e.g., Deaux & Ullman, 1983; O'Farrell & Harlan, 1982). We suggest that women in nontraditional jobs may experience more sexual harassment because they are more likely than other women to come into contact with men at work.

Similarly, the literature suggests that women are sexually harassed more than men (diTomaso, 1989; Dunwoody-Miller & Gutek, 1985; Gutek et al., 1980; MacKinnon, 1979; Tangri et al., 1982; Terpstra & Baker, 1988; U.S. Merit Systems Protection Board, 1981). Women are also more likely to come into contact with men at work than men are to come into contact with women. Although women tend to work with women and men tend to work with men because the labor force and jobs are gender-segregated (Beller, 1984; Bielby & Baron, 1984; Blau & Ferber, 1985), women are more likely to work with men than men are to work with women. This is so both because women have been moving into traditional men's jobs much faster than men have been moving into traditional women's jobs (Beller, 1984) and because men tend to occupy positions in which they supervise women, but women rarely supervise men (Nieva & Gutek, 1981). Therefore, the greater amount of sexual harassment women report could conceivably be attributable to their having greater contact with men at work than men have with women.

> Hypothesis 1: People who have a lot of contact with people of the other gender at work will report more sexual harassment, more nonharassing sexual behavior, and a more sexualized work environment than people who have little contact with the other gender at work.

The Gender Hypothesis

The contact hypothesis ignores the fact that social-sexual behavior is inherently "gendered": men and women have different experiences because there are specified roles for men and women in social-sexual behavior (Grauerholz & Serpe, 1985; Zellman & Goodchilds, 1983). Men and women are expected to behave in a manner consistent with established gender roles, and those expectations are likely to spill over to their work role, a phenomenon that Gutek and her colleagues (Nieva & Gutek, 1981; Gutek & Morasch, 1982) called sex-role spillover. Other people treat workers of both genders in a way that is consistent with gender role expectations, regardless of the workers' occupational roles. In sexual behavior, men are expected to initiate and women are expected to respond (Kinsey, Pomeroy, & Martin, 1948; Zilbergeld, 1978). In a workplace, male initiation may include making sexual overtures and propositions, both harassing and nonharassing, as well as making sexual jokes, comments, and innuendos, and posting girlie pictures. Thus, the gender hypothesis suggests that men will make more overtures than women will at work and therefore, compared to men, women will receive more sexual overtures, both harassing and nonharassing.

> *Hypothesis 2: When the amount of contact between women and men at work is held constant, women will report more sexual harassment and nonharassing sexual behavior than men.*

Additionally, the work environment of men should be more sexualized than the work environment of women because men are expected to be more likely to make sexual jokes and comments, advertise their sexual conquests, and so forth. Men may do so in part because they are more likely than women to say that social-sexual behaviors such as offering a sexual comment or a sexual touch are appropriate at work (Collins & Blodgett, 1981; Gutek, Morasch, & Cohen, 1983; Reilly, Carpenter, Dull, & Bartlett, 1982). Men should report a more sexualized work environment than women even when their amount of contact with women is controlled. Previous studies that have not taken amount of contact into account have shown that men do report more workplace sexualization than women. More men than women report the occurrence of sexual jokes and swearing at work (Gutek, 1985; Hearn, 1985; O'Farrell & Harlan, 1982; Sheppard, 1989).

> *Hypothesis 3: When the amount of contact between men and women is held constant, men are more likely to report working in a sexualized environment than women.*

As mentioned above, social-sexual behavior entails different roles for men and women. Thus, the amount of contact with members of the other gender at work may have different effects for men and women: amount of contact and the gender of the recipient of social-sexual behavior may interact. When men have a lot of contact with other men at work, they may show an increased tendency to initiate sexual overtures toward the women who

are present at work, and women who come into a lot of contact with men at work may show an increase in the number of sexual overtures they receive at work. Women might experience increased social-sexual overtures—both harassing and nonharassing—when they have a lot of contact with men at work. But because sexual initiation is not associated with women's gender role, more contact with women may not necessarily increase a man's chances of receiving a harassing or nonharassing overture from a woman. In addition, whereas women are usually subordinates or junior colleagues when they work with a lot of men (Nilson, 1976; Shrank & Riley, 1976), leaving them especially vulnerable to sexually harassing overtures, men are often supervisors in woman-dominated work groups (Etzkowitz, 1971; Fairhurst & Snavely, 1983; Segal, 1962), which may inhibit women even more from sexually harassing them.

Similarly, a lot of contact with other-gender workers may increase the perception that a work environment is sexualized for women but not for men. Although men may tell more sexual jokes and make more sexual comments at work than women, a man working exclusively with women may feel inhibited from making such comments, whereas a man who works with lots of men may feel freer to make sexual or sexist comments (Konrad & Gutek, 1986). For men, therefore, increased contact with women may not increase and may actually decrease the perception that a work environment is sexualized. On the other hand, a woman who might otherwise have little interest in doing so may feel that she needs to tell the same kind of jokes the men tell in order to fit in with a group of men (Kanter, 1977a,b). For women, increased contact with men at work should increase reports of sexualization of the workplace.

Accordingly, we offer this alternative to Hypothesis 1:

> *Hypothesis 4: Women who come into contact with many men at work will report more sexual harassment, more nonharassing sexual behavior, and a more sexualized work environment than women who come into contact with few men at work. For men, sexual harassment, nonharassing sexual behavior, and sexualization of the work environment will not vary with their amount of contact with women at work.*

Effects of Sexualized Work Environments on Social-Sexual Behaviors

A sexualized work environment, in which sexual jokes, comments, innuendos, and sexual or seductive dress are tolerated, condoned, or encouraged, is likely to encourage people of both genders to make direct sexual overtures. Thus, although contributing to a sexualized work environment can be considered a type of social-sexual behavior, the existence of such an environment may also predict direct social-sexual overtures of both the harassing and nonharassing varieties.

> *Hypothesis 5: The sexualization of the work environment will have a direct, unique effect on the amount of sexual harassment and nonharassing sexual behavior that occurs in a workplace.*

METHODS

The present study was a secondary analysis of a stratified random sample of working men and women in Los Angeles County who were surveyed in the summer of 1980. The study population was defined as people who (1) were 18 years of age or older, (2) were employed outside the home at the time of the interview 20 hours or more per week, (3) have been working for at least the previous three months, and (4) came into contact with members of the opposite gender at work. These contacts could be with co-workers, supervisors, subordinates, customers, or clients. We randomly sampled households using a computer-generated list of telephone numbers (random-digit dialing);[1] within households, eligible members were selected randomly using the Kish (1965) method. More women ($n = 827$) than men ($n = 405$) were interviewed because one focus of the research was sexual harassment, a problem more women than men face. The 1,232 respondents were interviewed by telephone in their homes about their work and their interactions with people of the other gender at work. Bilingual interviewers using Spanish-language questionnaires conducted 65 of the interviews. More details about the sampling and the procedures performed appears in Gutek (1985), in the first chapter and in Appendixes A and B.

Independent Variables

The independent variables were the gender of a respondent and his or her amount of contact with the other gender at work. Gender was ascertained before the interview began since men and women were sampled separately. Amount of contact was measured by the linear addition of the coded answers to three questions, which are listed in the Appendix ($\alpha = .65$). Table 1 shows the correlations among all variables.

Dependent Variables

Three aspects of social-sexual behavior at work were measured: perceived sexualization of the work environment, perceived sexual harassment, and perceived social-sexual behaviors not seen as harassing.

Perceived sexual harassment was measured in the following way: if a respondent had experienced any of eight social-sexual behaviors at their current job and defined such behavior as sexual harassment in general, we

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[1] In random-digit dialing, a computer program selects the three-digit central office codes in the proportion to which they exist within the population under study and pairs them with four random digits, producing a sample of telephone numbers.

TABLE 1
Means, Standard Deviations, and Correlations for All Variables

Variables	Means	s.d.	n	1	2	3	4
1. Gender	1.67	0.47	1,232				
2. Contact with other gender at work	6.93	1.50	1,222	.103***			
3. Sexualization of work environment	0.01	4.68	1,157	−.056	.178***		
4. Nonharassing sexual behavior	1.77	0.42	1,223	.016	.294***	.182***	
5. Sexual harassment	1.31	0.46	1,223	.097**	.142***	.244***	.096**

** p < .01
*** p < .001

considered the respondent to have experienced sexual harassment. The eight social-sexual behaviors we asked about ranged from actions rarely considered harassment to those generally considered harassment. They were making complimentary sexual comments, making insulting sexual comments, giving complimentary looks or making complimentary gestures, giving insulting looks or making insulting gestures, touching sexually, touching nonsexually, socializing with members of the other gender as part of the job, and having sexual relations with members of the other gender as part of the job. Using this method of measuring sexual harassment, we categorized 24.6 percent of the men and 34.1 percent of the women as having been sexually harassed on their current job.[2]

Nonharassing sexual behavior was measured in an analogous manner: if a respondent had experienced any of the eight social-sexual behaviors listed in the above paragraph on their current job but did not generally consider such behavior to be sexual harassment, we considered the respondent to have experienced nonharassing sexual behavior. Otherwise, nonharassing sexual behavior did not occur. Nonharassing sexual behavior was more common than sexual harassment. Among the men, 76.2 percent had experienced nonharassing sexual behavior, and 77.6 percent of the women had had such an experience.

To measure the degree to which a work environment was sexualized, we added the z-scores of the eight survey items pertaining to the work environment shown in the Appendix (α = .73).

Perceived work environment sexualization was moderately correlated with both perceived sexual harassment (r = .24, p < .001) and perceived

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[2] Our measurement of perceived experiences of sexual harassment and nonharassing sexual behavior imposes some interpretation on the respondents' reports in that the experience of the social-sexual behaviors and the characterization of that behavior in general were independent. Although this approach removes some of the emotional charge that accompanies personal reports of sexual harassment, it is somewhat removed from the phenomenological perception of the event.

nonharassing sexual behavior ($r = .18$, $p < .001$), whereas the two direct-experience variables were less strongly related to one another ($r = .10$, $p < .001$).

Analytic Strategy

The five hypotheses were examined in three steps. First, a multivariate analysis of variance (MANOVA) was performed with gender and amount of contact with the other gender at work as independent variables and sexual harassment, nonharassing sexual behavior, and work environment sexualization as dependent variables. Second, we explored the first three hypotheses in a series of multiple regression analyses for each of the three dependent variables.[3] In each analysis, we entered the two independent variables together in the first step and the interaction term in the second step.

Third, since we hypothesized that sexualization of a work environment predicts experiences of specific social-sexual behaviors (Hypothesis 5), we performed regression analyses to determine the effects of environmental sexualization on perceptions of both sexual harassment and nonharassing sexual behavior. In these analyses, we controlled for the independent variables.

RESULTS

Gender, Contact, and Sexual Harassment

A MANOVA was conducted with the two independent and three dependent variables. The effects for gender (Wilks's lambda = .987, $F_{3,1128}$ = 4.81, $p < .005$) and contact with the other gender (Wilks's lambda = .894, $F_{18,3191}$ = 7.19, $p < .001$) were significant. The interaction was also significant (Wilks's lambda = .972, $F_{18,3191}$ = 1.77, $p < .05$). Therefore, further investigation of the effects of gender and contact with the other gender at work appeared justified.

Table 2 shows the results of a multiple regression analysis of perceived sexual harassment. Both independent variables had significant main effects. Consistent with Hypothesis 1, results show that perceived sexual harassment increased as amount of contact with the other gender increased, and consistent with Hypothesis 2, results show that women reported signifi-

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[3] Measuring the perceived experiences of sexual harassment and nonharassing sexual behavior as dependent variables technically violated the assumptions of regression analysis and analysis of variance that dependent variables be normally distributed. However, the practice is common and considered valid (Cohen & Cohen, 1983: 241), especially if a sample is large and the ratio of the dichotomous values is not too skewed (Hayes, 1981: 211–214; McGhee, 1985: 188–189).

Because there is a growing trend in research to use logarithmic linear regression analysis when a dependent variable is dichotomous, we also performed log linear regressions for the analyses presented in Table 2; results were the same as those shown in the table. We report only the ordinary-least-squares results because they are familiar to most readers and using them facilitates the comparison of results across Table 2.

TABLE 2
Effects of Gender and Contact[a]

Step	Variables	Perceived Sexual Harassment[b]		Perceived Nonharassing Sexual Behavior[b]		Sexualization of Work Environment[c]	
		Partial Correlation	Unique R^2	Partial Correlation	Unique R^2	Partial Correlation	Unique R^2
1	Gender	.083**	.007**	−.014	.000	−.077**	.006**
	Contact with other gender at work	.134***	.018***	.294***	.087***	.186***	.034***
2	Interaction	.007	.000	.016	.000	.064*	.004*
	Total R^2		.027***		.087***		.041***

[a] The unique R^2 reflects the square of the semipartial correlation (Cohen & Cohen, 1983: 88–90) labeled the "part correlation" in output of the SPSS-X statistical program (Norusis, 1988: 39–40). Because we entered gender and contact in the same step, the sum of unique R^2's for each variable may not exactly correspond to the final total R^2 for an equation.

[b] Statistics are based on $n = 1,213$.

[c] Statistics are based on $n = 1,148$.

* $p < .05$

** $p < .01$

*** $p < .001$

cantly more sexual harassment than men. Contrary to Hypothesis 4, however, the interaction was not significant: both men and women experienced more sexual harassment as their amount of contact with the other gender increased.

Gender, Contact, and Nonharassing Sexual Behavior

Table 2 also shows the results of a multiple regression analysis with nonharassing sexual behavior as the dependent variable. In support of Hypothesis 1, the greater the contact with the other gender, the greater the perception of nonharassing sexual behavior. Contrary to Hypothesis 2, men and women were equally likely to report nonharassing sexual behavior on their current job. As was the case with sexual harassment, and again contrary to Hypothesis 4, the interaction was not significant: both men and women experienced more nonharassing sexual behavior as their contact with the other gender increased.

Gender, Contact, and Work Environment Sexualization

Table 2 also reports the results of a multiple regression analysis of the degree of sexualization of the work environments of respondents. Consistent with Hypothesis 1, reports of sexualization of the work environment increased as contact with the other gender increased. Consistent with Hypothesis 3, men reported more sexualization of work environments than women, as indicated by the negative coefficients for respondent gender. Consistent with Hypothesis 4, the interaction was significant: women reported much

more work sexualization as their contact with men increased, and men's reports of sexualization of the work environment varied much less across levels of contact with women. For women, contact with men was monotonically related to their reports of sexualization of the work environment, with scores on the scale ranging from -4.06 to 1.26; for men, scores showed much less variation, ranging from -1.38 to $.87$.

Work Environment Sexualization, Sexual Harassment, and Nonharassing Sexual Behavior

To test the hypothesis that the degree to which a work environment is sexualized reflects the acceptability of social-sexual behavior there, we employed multiple regression to ascertain the effects of sexualization of a work environment on perceived sexual harassment and nonharassing sexual behavior, controlling for respondents' gender and degree of contact with the other gender. The degree of a work environment's sexualization accounted for an increment of 5.2 percent in the variance in perceived sexual harassment ($F_{1,1140} = 64.24$, $p < .001$) and of 1.7 percent in the variance in sexual behavior perceived as nonharassing ($F_{1,1140} = 20.97$, $p < .001$).

A Model of Social-Sexual Behavior at Work

Using the results of the multiple regression analyses, we constructed a model of the relationships among an individual's gender, contact with the other gender, and social-sexual experiences at work. Figure 1 depicts the model. Degree of contact with the other gender is a direct consequence of the gender of a respondent, since women are more likely to work with many men than men are to work with many women (Beller, 1984; Gutek, 1988). We found that contact with the other gender at work directly predicted the sexualization of a work environment: the presence of workers of the other gender tends to sexualize an environment. The gender of a respondent also predicted the sexualization of a work environment, with men reporting more

FIGURE 1
A Model of Social-Sexual Behavior at Work
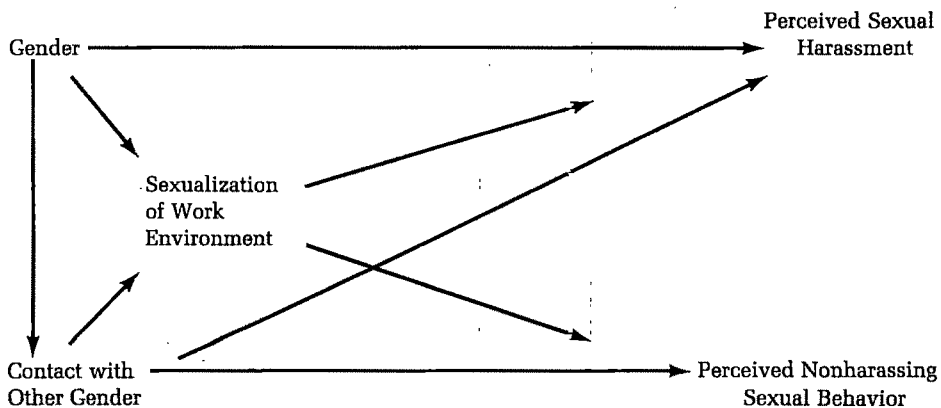
sexualized work environments than women. Sexualization of the work environment in turn predicted the incidence of both harassing and nonharassing social-sexual behavior, as did the presence of workers of the other gender. As has previous research, our results demonstrated that women are more likely than men to be sexually harassed.

DISCUSSION

Most research on social-sexual behavior at work has focused exclusively on sexual harassment. We identified two additional, fairly independent categories of social-sexual behavior at work: nonharassing sexual behavior and sexualization of the work environment. About one-third of the women and one-fourth of the men studied had been sexually harassed in their current jobs by our definition of harassment, but nonharassing sexual behavior was much more common: 76.2 percent of the men and 77.6 percent of the women had experienced some nonharassing social-sexual behavior on their current job.

We explored two hypotheses about social-sexual behavior at work and found some support for each. According to the contact hypothesis, an individual's experience of social-sexual behavior at work is simply a function of the amount of contact the person has with the other gender there. A fairly rough measure of such contact accounted for significant amounts of variance in people's perceptions of having experienced sexual harassment, nonharassing social-sexual behavior, and sexualization of their work environment. Frequency of contact with the other gender at work accounted for about 9 percent of the variance in social-sexual behavior seen as nonharassing, the most common form of social-sexual behavior at work. Contact was more weakly, but still significantly, related to sexualization of the work environment and sexual harassment.

Contact with the other gender may help to explain some consistent findings in the literature. For example, the fact that women have more contact with men at work than men have with women may partially explain why women are more likely to report being sexually harassed than men (e.g., Gutek et al., 1980; Tangri et al., 1982). Likewise, accounts of women in nontraditional jobs being especially subject to sexual harassment (Deaux & Ullman, 1983; Kanter, 1977a; O'Farrell & Harlan, 1982) may be partially a result of their relatively high rates of contact with men at work.

Our findings also show, however, that contact alone cannot account for extant findings. Men and women do have different experiences, as the gender hypothesis suggests. First, it is worth noting that contact itself differs by gender. Women are somewhat more likely than men to have frequent contact with the other gender at work. In response to the question "How much of the time does your job require that you work with the other sex?", 49.7 percent of the women and 33.4 percent of the men reported frequent contact. Second, although people who come into contact with the other gender were more likely than others to report being sexually harassed, women were somewhat

more likely than men to be sexually harassed, regardless of amount of contact. Third, gender was related to perceived sexualization of the work environment. Although people who frequently came into contact with the other gender were more likely to work in a sexualized work environment than those who did not, men were somewhat more likely than women to report that in their work environment sexual jokes and comments were common, that both men and women were expected to dress in a sexually attractive or seductive manner, and that there was social pressure to flirt.

Although the magnitude of the effects was small, women did report more sexual harassment than men, independent of the effects of contact. Why should this be? Differences in power between the genders, both in position at work and in society at large, can help explain these findings. In fact, Lipman-Blumen (1984) contended that relations between men and women are a prototype for power relationships (cf. Connell, 1987). In *Gender Roles and Power,* Lipman-Blumen argued that all women are relatively powerless vis-à-vis men. Thus, a woman with a man for a supervisor might feel relatively powerless to try to stop his sexual jokes and comments, but so might a woman who works with many male peers or any woman who is physically smaller than most men.

Differences in both organizational and societal power can help explain gender differences in reported sexual harassment, but power is not particularly useful in explaining why men more frequently report sexualization of their work environment than women. However, role concepts such as sex-role spillover are useful. Men are expected to take the role of sexual initiator, which can include making sexual comments, telling about sexual conquests, and using sexual language, as well as making direct sexual overtures. Studying and understanding the sexualization of a work environment is especially important because of its pivotal mediating role. Being a man and having frequent contact with women at work both contribute to workplace sexualization, which in turn facilitates both sexual harassment and nonharassing sexual behavior. In most instances, the sexual comments or gestures men make to women in these sexualized environments are not harassing, but sometimes they are. This suggests, consistent with research by O'Farrell and Harlan (1982), that some work environments dominated by men "create a hostile and offensive work environment" (Equal Employment Opportunity Commission, 1980) for women and supports the EEOC's inclusion of a polluted work environment as a component of sexual harassment.

Further, the analyses support a model of sexual harassment in workplaces that is driven by men more than women, both because the presence of men is associated with a sexualized work environment and because men harass women more than women harass men. Women may appreciate advice about how to avoid sexual harassment or deflect sexual comments and overtures, but organizational efforts to reduce sexual harassment, flirting, and sexual joking might most profitably be directed to men, particularly to supervisors who have the power to neutralize an oversexualized work envi-

ronment. Managers can work to desexualize the contact between men and women at work by establishing appropriate standards of language, conduct, and dress.

Although sexual harassment is an important issue and deserves attention, nonharassing sexual behavior is much more common than harassment. Almost four-fifths of the sample reported experiencing some kind of social-sexual behavior or comment in their current job that they did not generally consider harassment. These phenomena can range from requests for dates and sexual comments that are perceived as flattering through mildly offensive comments or gestures to physical contact that is unwanted and uncomfortable but not so uncomfortable as to be labeled harassment. From our data, we know that men and women are equally likely to report such nonharassing sexual behavior and that the amount of such behavior is associated with the amount of contact they have with the other gender at work. We know, however, relatively little about the consequences—if any—of such behavior.

Our study has both strengths and weaknesses. Our results, based on a large stratified random sample of working men and women in a major metropolitan area, have the shortcomings of all cross-sectional results: common method variance, resulting from our obtaining all our information through interviews, and a limited ability to address causal relationships among variables. Although it does not make sense to think of work environment sexualization determining whether someone is a man or a woman, it does make sense to think that a sexualized work environment might lead to greater contact between men and women and that sexual harassment and nonharassing sexual behavior might lead to a more sexualized work environment. Regardless of the direction or degree of reciprocality or causality, workplace sexualization occupies a pivotal role, and any change in it will affect several other variables.

Finally, we encourage more organizational research using the contact hypothesis. The concept of contact is simple and parsimonious, but the process by which contact affects people has not been studied in organizational behavior. Social psychological research showing that increased contact can lead to increased liking (Rubin, 1973: 113–133) and that, in fact, mere exposure to a stimulus increases liking (Zajonc, 1968) support the contact hypothesis. Our finding that amount of contact with the other gender can partially explain nonharassing sexual behavior may be grounded in increased liking associated with contact. Liking cannot, however, explain the relationship between contact and both sexual harassment and workplace sexualization. Perhaps more contact simply leads to stronger feelings, both positive and negative. Contact may also have other consequences. For example, contact with a person or situation may increase knowledge of that person or situation.

Contact is undoubtably associated with organizational behaviors besides social-sexual behavior, such as stereotyping (Terborg & Ilgen, 1975). Contact with a subordinate may affect a supervisor's rating of that subordinate because contact increases both liking and knowledge of the subordi-

nate's work. Employees generally vie for access to or contact with top management, presumably because such contact will have desirable outcomes. The amount of contact people have with supervisors and job-relevant co-workers is likely to be associated with the amount and type of communications within an organization and with levels of motivation, job satisfaction, and commitment to the organization. In short, contact is a simple concept that may have considerable utility for explaining behavior in organizations. Both the processes that lead to increases or decreases in contact and its outcomes merit attention.

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APPENDIX

Contact

How much opportunity is there for job-related talk with [men/women]? Would you say none, some, or a great deal?

How much opportunity is there to talk socially with [men/women]? Would you say none, some, or a great deal?

How much of the time does your job require that you work with [men/women]? Would you say none, some, or a great deal?

Sexualization of Work Environment

Would you say that joking or talking about sexual matters at your work place happens frequently, sometimes, or not at all?

Where you work, how much social pressure is there for women to flirt with men? A lot, some, or none?

Where you work, how much social pressure is there for men to flirt with women? A lot, some, or none?

How much of a problem at your place of work do you consider sexual harassment to be? Would you say it is a major problem, a minor problem, or no problem?

How many women dress to appear sexually attractive to men at work? Would you say most, some, hardly any, or no women do this?

How many men dress to appear sexually attractive to women at work? Would you say most, some, hardly any, or no men do this?

How many women present themselves in sexually seductive ways to men at work? Would you say most, some, hardly any, or no women do this?

How many men present themselves in sexually seductive ways to women at work? Would you say most, some, hardly any, or no men do this?

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EFFECTS OF CORPORATE SPONSORSHIP AND DEPARTMENTAL POWER ON CAREER TOURNAMENTS

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This study addressed the internal career mobility over a ten-year pe-
riod of 338 managers employed by a single firm. We found that how
managers started their careers in the company and the power of the
department in which they started strongly influenced rates of job pro-
motion, transfer, and salary progression. The implications for "career
tournament" processes are discussed.

In his seminal work on career mobility, Rosenbaum (1984) proposed the existence of organizational career systems that govern the internal career mobility of an organization's members. This perspective provided an important integration and expansion of the earlier human capital (Blaug, 1976; Mincer, 1974) and structural models of career mobility (Doeringer & Piore, 1971; Spilerman, 1977). Proponents of human capital models have stressed that individuals' ability, education, and training largely shape their career progression. Advocates of structural models have stressed the influence of job vacancy rates and organizational career ladders on internal mobility. In contrast, in the career system model Rosenbaum proposed that early career attainments in an organization affect career advancement. History has an influence on career moves that is enacted through an implicit tournament waged among organizational members. The tournament process determines which employees are considered for advancement and how fast they advance in their organization.

Rosenbaum (1984) indicated that the tournament process is sensitive to

obvious differences in human capital attributes among organizational members. Not all tournaments, however, are contested on a level playing field. To further enhance selection efficiency, an organization may sponsor certain members for high career mobility. Those who are selected receive the benefits of specialized training and socialization into the organization's culture very early in their careers.

These early experiences send signals regarding an individual's ability and anticipated career potential to top management (Arrow, 1973; Spence, 1973; Stiglitz, 1975). According to signaling theory, managers attempt to select employees for career advancement largely on the basis of the employees' effort, ability, and training. The difficulty of making such judgments requires managers to use certain social attributes and prior accomplishments as signals of employees' potential. Signaling theory suggests that the special career histories of sponsored individuals place them at an advantage during personnel selection decisions. Sponsored individuals thus receive the added benefit of a self-fulfilling inference made by senior managers. Their early experiences become magnified as they compete in subsequent tournaments.

The primary objective of this study was to expand research knowledge of the tournament effects that can be attributed to organizational experiences. In the foreword to Rosenbaum's (1984) book, Spilerman cautioned about trying to generalize the tournament results described therein across a variety of organizations. Forbes (1987) reported finding less general support for the existence of tournament processes in an organization very different from the one Rosenbaum studied. However, the research designs the two authors used provide little information on the organizational factors that were influential in the managers' early career experiences. Previous evidence indicating which organizational variables have the strongest impact on career advancement has been inconsistent (Markham, Harlan, & Hackett, 1987). An important objective of the present study was to investigate the effects of early organizational experiences on subsequent career mobility. We conjectured that two variables associated with a manager's initial job affect future career mobility. These are (1) the signals conveyed by how a career starts and (2) the organizational power of the department in which an individual starts. We hypothesized that these variables have a significant effect on the speed of job advancement and the rate of salary progression throughout a manager's career.

HYPOTHESES

Career Start

According to prior research, early career success is critical to future positions in an organization. Rosenbaum (1979, 1984) found that managers promoted early in their careers were much more likely to receive further promotions than those who were not promoted early and that the former reached higher managerial levels. He suggested that the timing of promo-

tions signals senior managers about an employee's ability and stated that signaling affects not only career mobility but also earnings. Using the level of subsequent earnings as a dependent variable, he regressed total organizational seniority, starting age, education, gender, and the selectivity of the college attended on earnings and found that all these signals were significantly related to subsequent earnings (Rosenbaum, 1984: 198). The present study also suggests that early organizational signals have important economic consequences. We posited that these signals influence the rate of salary increases during managerial careers.

Forbes (1987) found that in addition to early promotions, managers appear to use an employee's past position, career movement, and functional background as signals that guide promotion decisions. He found that administrative employees moved up more quickly than technical employees but then plateaued. Employees with technical backgrounds waited longer for a promotion but ultimately reached higher organizational levels than administrative employees. Forbes conjectured that these differences reflected signaling effects that were consistent with the economic growth rate and business strategy of the firm he studied and the differences in power among the firm's departments.

Berlew and Hall (1966) studied new managers over a four-year period. Their findings indicated that those assigned demanding initial jobs performed better and were more successful than those assigned less demanding jobs. They attributed their results to managers having a demanding job in their first year, not to their first year's performance. Meeting a company's expectations in a demanding job signals senior managers that a new employee has been able to make sense out of the organizational environment and has begun to identify with the organization's core value systems. Veiga found similar results in his study, concluding that "the time in the first position is a fairly powerful predictor of a manager's rate of career movement" (1983: 82).

A series of studies conducted at AT&T over the past 30 years (Bray, Campbell, & Grant, 1974; Howard & Bray, 1988) has focused on individual, not organizational, factors that affect success. This research has found that (1) young managers who received more challenging jobs were more productive and attained higher levels than those who did not receive challenging jobs, (2) important changes in motivation take place after a few years of employment, and (3) managers who advanced showed strong increases in job involvement, independence, and ability to take charge in group situations and had lower affiliation needs than managers who did not advance.

In the present study, we hypothesized that a new employee's selection for the company's trainee program sent salient signals regarding the employee's expected value and anticipated career path. The purpose of the company's management trainee program is to recruit and select entry-level management employees for eventual succession to executive positions. This program, a well-established tradition in the company's culture, dates from 1927, when trainees were referred to as "cadets."

After conducting extensive interviews both on college campuses and at the company's headquarters, personnel officers extend offers to become management trainees to graduates having the highest rated potential to demonstrate ten behavioral traits expected of the company's managers. These include leadership, initiative, technical knowledge, and communication skills. The trainees start their orientation to the firm at a luncheon where they are introduced to the company's officers and department heads as future leaders of the firm. It is the beginning of their socialization into the corporation's culture. Each year's cohort of new trainees completes a two-month orientation program during which they rotate through various departments. This orientation period provides an opportunity for most department heads to observe and get acquainted with the trainees. Special dinners with the officers of the company provide trainees with mentoring and networking opportunities. Biweekly group meetings with four or five trainees and the company's vice president of human resources provide another vehicle by which the trainees can discuss opportunities and problems. Finally, a manager who gives feedback on job and personal issues closely monitors each trainee's performance. Following this orientation period, each department requests placements for no more than three trainees in order of preference. Each trainee also requests placements for three departments in order of preference. The company does not, however, determine actual placements solely on the basis of the preferences of either the departments or the trainees. Often, departments and trainees engage in open bidding, trading, and bargaining. Once the trainees are placed in departments, they are required to work as trainees for 12 months. Following successful completion of this trainee year, they are assigned their first management job.

Other managers start their careers in the company in a manner that does not convey the same signals inherent in starting as a trainee. The company tells them little about future attainments and schedules no special socialization events for them. Some are hired from outside the firm and placed directly into vacant positions and others are promoted into management jobs from nonmanagement positions within the firm. Although the company selects all new managers on the basis of their strong career potential, we posited that the signaling effects associated with sponsorship in the trainee program influence future career mobility in three important ways:

> *Hypothesis 1: Individuals who started their management careers as company trainees will have faster internal career mobility than individuals who are directly hired into management jobs or promoted from nonmanagement positions in the company.*

> *Hypothesis 2: The probability of being promoted or transferred into different management positions will be higher in earlier months of job tenure for managers who started their careers as trainees than for other managers.*

*Hypothesis 3: Salaries will increase at a greater rate for
managers who started their careers as trainees than it will
for other managers.*

The time spent in the first management job was also posited to send an
important signal to senior managers. The longer a manager holds a job, the
greater is the likelihood that decision makers will subsequently infer that the
individual has been passed over in early job competitions. This early signal
will be likely to slow later career moves. The decision to move a manager
from his or her first job slowly communicates that the individual lacks the
ability others have shown in their early job assignments. This message has
consequences that often limit chances of subsequent advancement and may
reduce the level of ultimate career attainment. Conversely, early transfer or
promotion signals strong career potential. We expected fast starters—
individuals who are quickly transferred or promoted from their first man-
agement job—to move rapidly through subsequent job assignments and at-
tain higher levels in the organizational hierarchy than slow starters, or those
who spend a longer time in their first management job.

*Hypothesis 4: Slow starters will have a longer tenure in
each subsequent job they hold than will fast starters and
will attain lower levels of management by the end of a
given period.*

Departmental Power

With the exception of Forbes's (1987) broad classification of technical
and administrative career paths, previous research has failed to consider the
career consequences of early job experiences in different departments. We
posited that the location of a starting job may influence later career mobility
because various job assignments expose managers to different bases of orga-
nizational power. According to Hickson, Hinings, Lee, Schneck, and Pen-
nings (1971), a department's power is predicated on its ability to control or
reduce uncertainty in a firm's external environment. Uncertainty does not
give power, but a department's ability to cope with it provides the bases for
managerial inferences about the department's degree of influence in an or-
ganization.

Research findings of Crozier (1964), Salancik and Pfeffer (1974, 1977),
and Giroux, Mayper, and Daft (1986) have indicated that power depends on
a department's ability to cope with the critical strategic exigencies facing a
firm. Such ability often places specific functional departments in positions
of relatively high power because they have a key role in implementing the
firm's strategy. Even firms operating in the same industry face unique envi-
ronmental conditions because of the strategy they have chosen to enact. Each
strategy entails certain critical success factors a firm needs to achieve if it is
to be effective. Firms manage critical success factors by delegating imple-

mentation responsibility to the heads of various functional departments (Fox, 1973; Hitt, Ireland, & Stadter, 1982; Snow & Hrebiniak, 1980).

Because of their key role in implementing corporate strategies, managers in powerful functional departments are likely to have career mobility patterns that differ from those of managers in departments with little power. Powerful department heads can intercede favorably for subordinates, make them visible to top decision makers, and get them early information about key decisions, policy shifts, job openings, and the like. Researchers have offered two important theoretical explanations for this general pattern. First, March and Simon (1958) and Kanter (1977) stated that people's visibility to others in an organization is a positive factor influencing the ease of their movement either to other organizations or within the firm. Gould and Penley (1984) and Landau and Hammer (1986) argued that visibility allows employees to establish effective interpersonal networks within an organization. Although their data did not support this proposition, they argued that the jobs studied (clerk positions) might have constrained results.

Second, Rosenbaum (1984) and Forbes (1987) suggested that decision makers often conduct a limited search for candidates to fill job vacancies. Managers who are assigned initial jobs in powerful functional departments and who become known to senior executives and the heads of other powerful departments increase their likelihood of advancing throughout their careers in powerful departments. Several researchers (e.g., Pfeffer, 1982; Piercy & Forbes, 1981; Vardi & Hammer, 1977; Veiga, 1983) have found that individuals who are promoted develop attributes and attitudes similar to those of an organization's dominant coalition.

The visibility, networking, and resources available to managers in powerful functional departments are expected to propel them into faster careers than managers in less powerful departments will experience. Early assignments to powerful departments set managers on the path of future advances within those departments.

> Hypothesis 5: Managers who start their careers in departments with high power are likely to advance throughout their careers to other jobs in powerful departments. Conversely, managers who start their careers in departments with low power are likely to advance throughout their careers to other jobs in less powerful departments.
>
> Hypothesis 6: Regardless of how managers start their careers—as trainees or through direct hire or internal promotion—individuals who start in powerful departments will have faster internal career mobility than those who start in departments having low organizational power.
>
> Hypothesis 7: Regardless of how managers start their careers, salaries will increase at a greater rate for those who begin in powerful departments than for those who begin in departments having low power.

METHODS

Data Collection

The study included all 338 employees who started their management careers in a large public utility company during a ten-year period extending from September 1, 1977, to August 31, 1987. This company employs about 800 managers and another 2,700 employees, who are union members, in a single metropolitan area.

Managers entered this study period at different times. The career life we traced for each manager started with the date he or she began working in a first-level management position and concluded on the termination date or at the end of the study period, if the individual had remained actively employed in the firm. We collected archival data from the company's personnel files, recording a manager's age, type of job entry, organizational department, job level, and starting salary at the start of each job held. At the end of each job, we recorded the type of exit and the ending salary.

Measures

Career moves. Table 1 indicates the chronological distribution of the career moves examined in this study. There were five ways a manager could enter a new job. At the start of a career, entry could be through (1) direct hire from outside the company into a vacant management job, (2) internal promotion from a nonmanagement position within the firm, or (3) successful completion of the company's trainee program. For subsequent jobs, entry could be through (4) lateral transfer from a different management job or (5) promotion from a different management job.

TABLE 1
Internal Career Activity

Variables	Study Period[a]											
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	Total
Type of start[b]												
Direct hire	6	9	10	16	15	19	21	19	19	22	10	166
Internal promotion	0	0	4	2	6	10	18	10	18	9	2	79
Trainee program	1	6	3	7	15	12	5	24	6	11	3	93
Total	7	15	17	25	36	41	44	53	43	42	15	338
Career moves												
Transfers	0	1	2	9	10	20	27	34	38	20	25	186
Promotions	0	1	10	12	17	21	45	53	77	48	9	293
Total	0	2	12	21	27	41	72	87	115	68	34	479
Career ends												
Job termination	0	0	0	0	0	1	3	19	20	21	17	81
Actively employed												257

[a] The period began on September 1, 1977, and ended on August 31, 1987.

[b] For the three types of career start as listed, the average ages of individuals were 29.3, 27.9, and 23.3 years, and the numbers of women were 25, 35, and 37 percent.

The managers studied held an average 2.45 jobs during the ten-year period. A total of 122 managers (36%) held only one job, and 3 managers held seven jobs. Lateral transfers accounted for 40 percent (N = 186) of the moves. We defined a lateral transfer as a move involving no salary increase to a new job having the same range of Hay points as the previous job. The remaining 60 percent (N = 293) of the career moves were promotions, moves involving a salary increase to a job with a higher range of Hay points. The average salary increase associated with these managers' promotions was $4,088, representing an average 13.8 percent increase in annual salary.

A total of 81 managers (24%) voluntarily terminated their employment during the study period, after an average 31.7-month career in the company. The remaining 257 managers (76%) were actively employed by the company at the end of the study period and at that time had an average 52.2 months career seniority.

Job level. The Hay point system used by the company establishes a compensation structure for different management jobs (Sargent, 1972). The system rates each job's relative magnitude and scope on three dimensions: responsibility, requirements, and working conditions. Jobs received between 200 and 700 Hay points. The company studied here considers its first-level management jobs as those having between 200 and 300 Hay points. At the first level of management, each job has a range of 20 to 30 points. At higher levels of management, jobs have a range of about 60 points.

Salaries. The rate of inflation varied greatly during the ten years studied. The federal government's Consumer Price Index increased at an average annual rate of about 9.8 percent during the early years of the period (1977–82) and at about 3.3 percent during the later years, 1983–87 (Bureau of the Census, 1989). To control for inflation, we multiplied the starting and ending job salaries in each year by the compounded annual inflation rate to obtain estimates of salaries in 1987 dollars.

Organizational power. The company studied has 22 departments. We asked 23 senior executives of the company to rate these departments by categorizing each into a forced distribution of high, medium, and low power, defining power as "the ability of a department to influence other departments to bring about its desired outcomes" (Daft, 1986: 385).

There was 62 percent interrater agreement for the power ratings across all departments. Each department we placed in the high-power group had been so rated by 61 to 91 percent of the raters, and each department categorized as having low power had been so rated by 56 to 74 percent of the raters. There was less agreement regarding the organizational power of the remaining 10 departments, which we grouped into a medium-power category. Although the power ratings were obtained in 1987, a post hoc review of the categories with the company's senior vice presidents confirmed that they were valid and represented conditions present over the ten-year study period.

Powerful departments were those able to cope with the critical strategic exigencies facing the firm. The functional areas rated as having high orga-

nizational power included the Customer Service, Distribution, Operations, Engineering, and Marketing departments, and the executive offices. Members of these departments directly interfaced with the Public Utility Commission, various consumer action groups, and other powerful stakeholders operating in the firm's external environment who could affect the company's financial viability. During the ten-year study period, 88 managers (26%) started their careers in the 6 high-power departments; 65 (19%) started their careers in the 6 low-power departments; and 185 (55%) started in the 10 medium-power departments.

Data Analysis

Rosenbaum (1979) and Forbes (1987) conducted their research by following three-year cohort samples of people newly hired for management and nonmanagement positions. Rosenbaum followed 671 people over a 13-year study in a large *Fortune* 500 corporation employing more than 10,000 individuals. Forbes followed 180 people over an 11-year study in a major domestic oil company employing about 22,000 individuals. In both studies, the researchers recorded the current organizational level of these people at three- or four-year intervals and designated as tournament winners those who achieved a higher organizational level during a particular interval. Tournament losers remained at the same level or moved down during an interval. Both studies also used regression analyses with dummy variables to estimate time-lagged relationships among variables measured at different intervals. On the basis of the regression results, the researchers made indirect inferences regarding the dynamic career mobility processes that occurred between the fixed-time measures.

The present study used survival analysis (Berkson & Gage, 1950) to estimate the career mobility effects occurring over time. Survival analysis has three important advantages over the regression analyses Rosenbaum and Forbes used. First, it provides actuarial findings that enable a direct inference test of the speed at which different groups of managers advance in a company. The method thus circumvents a limitation of regression models that indirectly estimate dynamic effects occurring between arbitrary time intervals. Second, the data for a survival analysis can include all individuals hired during the entire study period, regardless of the date they started employment. Using such an expanded data base avoids the problem of estimating repeated regression models using a cohort sample taken only at the start of a study period. Third, the actuarial results of a survival analysis are based on the actual dates that career moves occur in a company. Thus, the confounding sampling errors inherent in measures of career moves based on observed changes in organizational level obtained at fixed time intervals do not arise.

Survival analyses provide direct inference tests of career mobility processes through actuarial estimates of the probability of managers reaching a particular length of job tenure. Tenure is measured from the first day an individual holds a job. The actuarial models estimate three statistics: cumu-

lative survival rates, tenure half-lives, and hazard rates for the occurrence of promotions and transfers during specific months of job tenure.

The cumulative survival rate is the proportion of managers who will remain in a specific job after a particular time. Cumulative survival rates decline with increasing tenure. Tenure half-life is an actuarial estimate of the number of months required before the cumulative survival rate declines to .5. This half-life point marks the tenure month when 50 percent of the managers have left their job assignments. Short half-lives for a particular group of managers indicate that these managers have fast internal career mobility.

The hazard rates for transfers and promotions are estimates of the conditional probability that managers who have spent a specific amount of time in a job will be transferred or promoted during the next month of tenure. A graph of these probabilities illustrates how the likelihood of transfers or promotions can increase, decrease, or fluctuate with increasing time in a job. This information points to tenure months when career moves are most likely to occur for particular groups of managers.

In this study, we converted the dates marking the entry and exit for each job into Julian calendar time in order to compute the number of days each job had been held. We rounded the number of tenure days to the nearest whole month. Managers' total career seniority was measured from the start of their first management job to their exit from the most recent job they had held at the end of the study period.

The job tenure months were grouped into 12 consecutive 6-month intervals representing the first 72 months of tenure that a manager could achieve in a particular job assignment. We estimated survival distributions over these intervals using a life-table analysis procedure developed for biomedical research by Berkson and Gage (1950), which Peters and Sheridan (1988) adapted for human resource management applications.[1] Differences in the survival distributions among different groups of managers were tested

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[1] We chose the nonparametric form of life-table analysis over the parametric forms of event-history analysis (Allison, 1984) for two reasons. First, this research is one of the first attempts to use survival analysis to estimate hazard rates for internal career mobility. Previous findings on external career mobility (Peters & Sheridan, 1988) suggested that the hazard rates were not likely to vary monotonically with increasing job tenure. Therefore, we could not apply the traditional mathematically derived survival functions in this study.

Second, although using the proportional hazard rate model could circumvent a lack of monotonicity (Cox, 1982), prior research did not give us any indication of the magnitude of the differences in survival times that we could attribute to the posited signaling and power effects. This a priori limitation raised potential difficulties in applying the proportional hazards model (Allison, 1984). Therefore, in this exploratory research, we decided to directly estimate the differences in half-lives through the life-table procedures. The findings that career start signals and departmental power effects accounted for as much as six months difference in job tenure half-lives raised the feasibility of using more robust proportional hazard models in future studies. The proportional hazards model would appear to be a particularly useful tool as researchers expand models of career tournaments to include a variety of individual and organizational effects and begin to explore the interactions among those variables.

using the D-statistic (Lee & Desu, 1972), a nonparametric test asymptotically distributed as a chi square.

RESULTS

Figure 1 illustrates the cumulative job survival distributions across all jobs held by managers who had different types of career starts in the company. The distributions indicate that all career moves were likely to occur within a manager's first four years in a job. Beyond 48 months, the survival curves are relatively flat, indicating that the few individuals who remained in the same job after four years were not likely to move. Only 5 percent of those who started as trainees remained in their subsequent management jobs after 48 months. In contrast, the 48-month survival rate was approximately 20 percent for managers who started their careers through direct hire or internal promotion from a nonmanagement position.

Hypothesis 1: Career Start

There were significant differences among the survival distributions (D = 23.18, df = 2, p < .01), showing strong support for Hypothesis 1. Individuals who started their careers as trainees moved through all subsequent management jobs much faster than those in the other groups studied. After

FIGURE 1
Job Survival Rates for Varying Career Starts

Job Tenure[a]
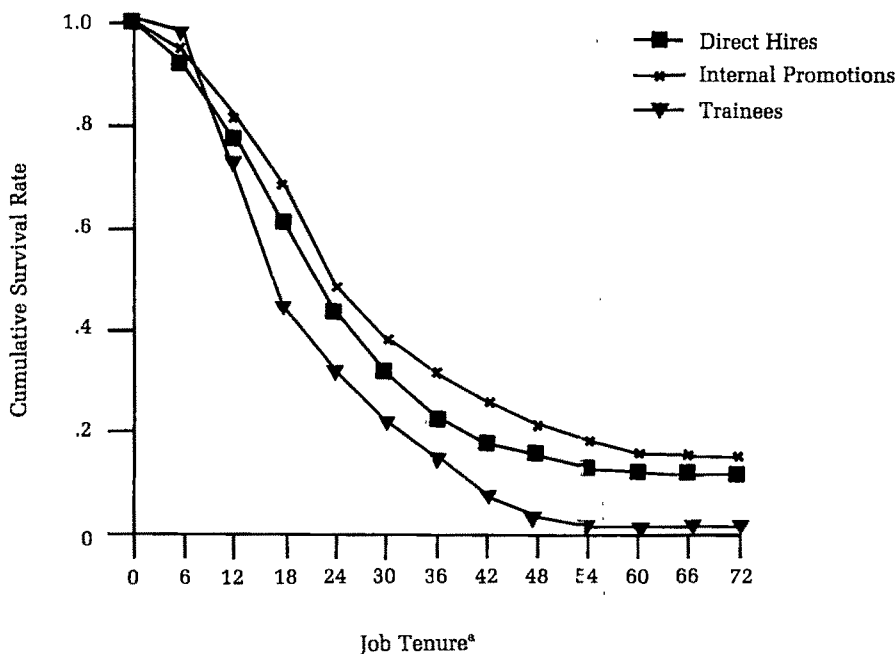
[a] Tenure is in months.

18 months on management jobs, only 45 percent of the trainees remained in their particular assignments. The 18-month job survival rates were 62 percent for managers who were directly hired and 70 percent for those who started their managerial careers after internal promotions from nonmanagement positions. Trainees stayed approximately 6 months less in all subsequent job assignments than did other managers. The tenure half-life for trainees was 16.9 months, compared to 22.0 months for those directly hired and 23.6 months for those who started their careers after internal promotions.

Hypothesis 2: Probability of Promotions and Transfers

Figures 2 and 3 illustrate the promotion and transfer hazard rates for managers with different career starts. The inverted U shape of these curves indicates that the probability of transfers and promotions increased with job tenure up to an inflection point representing the maximum probability for job reassignment. The probability then declined rapidly.

Figure 2 illustrates varying patterns of promotion hazard rates among managers who had different types of career starts in the company. A comparison of the graphs in Figure 2 supports Hypothesis 2. The monthly probability of promotion for trainees increased very rapidly after the start of a

FIGURE 2
Hazard Rates of Promotions for Varying Career Starts
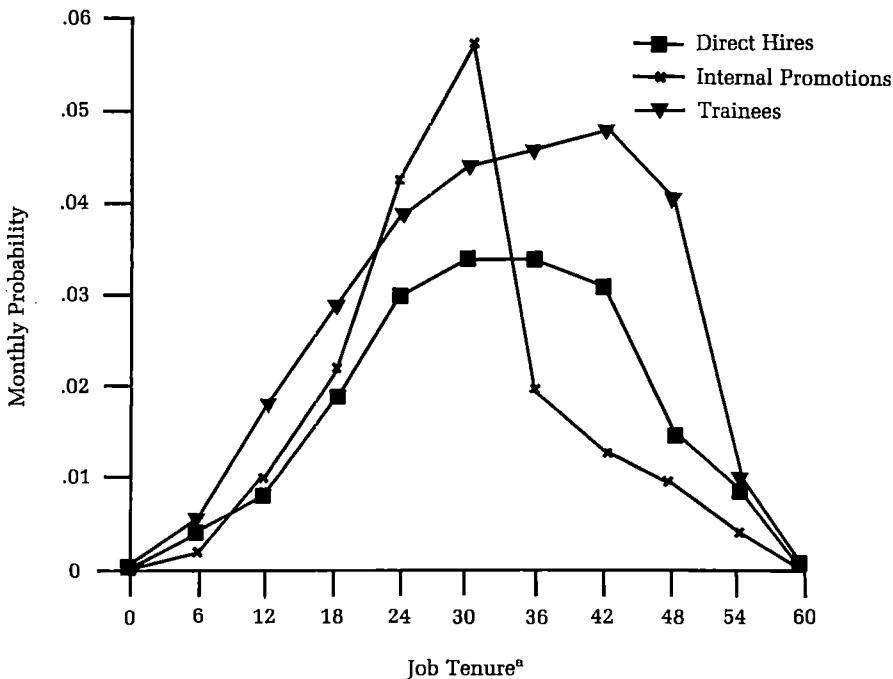
Job Tenure[a]

[a] Tenure is in months.

new job until it reached a plateau above 4 percent. The probability of promotion remained at this level for 12 months, between 30 and 42 months of job tenure, and then declined sharply during the fifth year of holding a job. A similar pattern of hazard rates occurred for managers who began their careers through direct hire. The plateau of highest promotion probability for these managers is at about 3 percent. Since the hazard rates are independent between groups, we could test the differences at corresponding tenure months using the binomial distribution (Peters & Sheridan, 1988). The differences between those directly hired and the trainees were large but not significant ($p < .10$) at the end of each six-month interval during the highest plateau period, occurring between 30 and 42 months tenure. In contrast, managers who started their careers after internal promotions from nonmanagement positions had a peak period of probable promotion near the middle of their third year on a job. The likelihood of promotion for these managers peaked at a significantly higher ($p < .05$) monthly probability, near 6 percent around the 30th month of job tenure. This peak period was, however, very short. The probability of promotion for this group was only 2 percent shortly before and after these peak tenure months.

A comparison of the transfer hazard rates illustrated in Figure 3 provides additional support for Hypothesis 2. At every month of job tenure, the

FIGURE 3
Hazard Rates of Transfers for Varying Career Starts
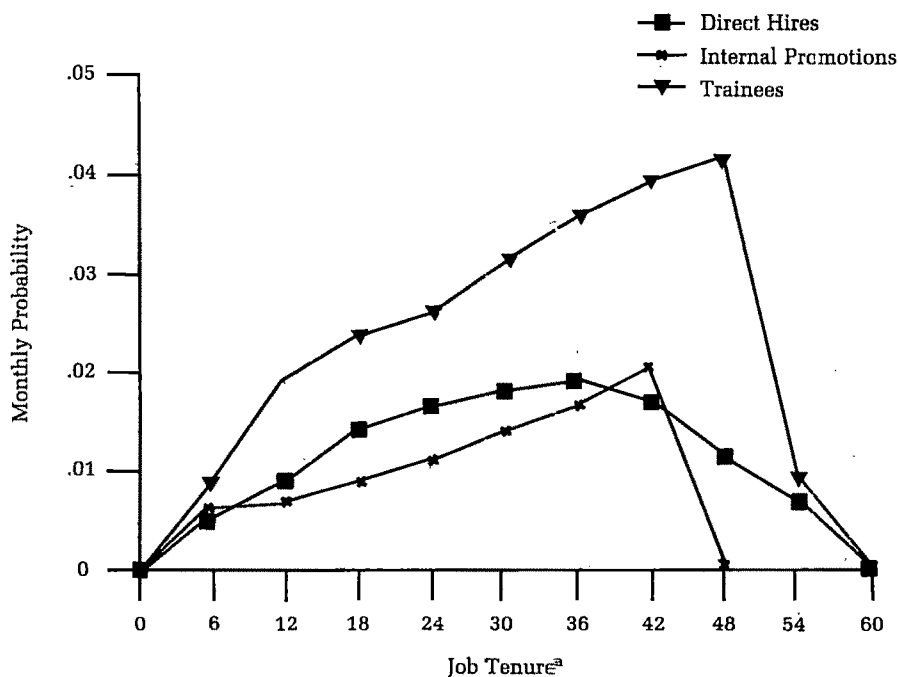
ª Tenure is in months.

trainees had a higher likelihood of making a lateral transfer than all other managers. The transfer probability for trainees increased continuously during their first 48 months on a job. Trainees who remained on a job near the end of four years had a significantly higher ($p < .05$) transfer probability than all other managers. The transfer probability for trainees then declined sharply during the fifth year of their job tenure. Managers who started their careers through direct hire or internal promotion had a similar pattern of transfer probability but had fewer transfers. The likelihood of transfers for these managers reached its highest probability near the end of their third year of job tenure.

Hypothesis 3: Career Start and Salary Progression

A three-way ANOVA combining type of career start, starting department's power, and job sequence was used to test the salary progression effects posited in Hypotheses 3 and 7. Since few managers advanced beyond a fourth job, we measured the monthly salary increment (the total salary increase from the start of a first job divided by total career seniority months) at the start of the second, third, and fourth jobs held.

Table 2 reports the ANOVA results for the monthly salary increments adjusted for inflation. The significant job sequence effects indicate that monthly salary increments increased significantly as the managers advanced to their second, third, and fourth jobs. This finding shows that the firm provided larger real salary rewards for managers who had held more jobs. The results support Hypothesis 3 by indicating that type of career start had a significant main effect on salary progression. No significant interaction effects emerged between career start and power or between career start and job sequence, indicating that the effects of career start did not diminish during the later jobs held.

Figure 4 illustrates the significant main effect on salary progression that can be attributed to type of career start. The largest differences in salary progression were between trainees and directly hired managers. The trainees' salaries increased at the greatest monthly rate during the first four jobs.

TABLE 2
Effects of Career Start and Organizational Power on Salary Progression

Variables	df	F^a
Job sequence	2	13.46**
Career start	2	31.83**
Departmental power	2	8.53**
Start × power	4	1.78
Start × sequence	4	0.13
Power × sequence	4	1.86*

  [a] Statistics were based on dollar increments to salaries per month of career seniority. We adjusted figures for annual inflation rates to reflect constant 1987 dollars.
  * $p < .10$
  ** $p < .01$

FIGURE 4
Salary Increases per Month of Seniority for Varying Career Starts
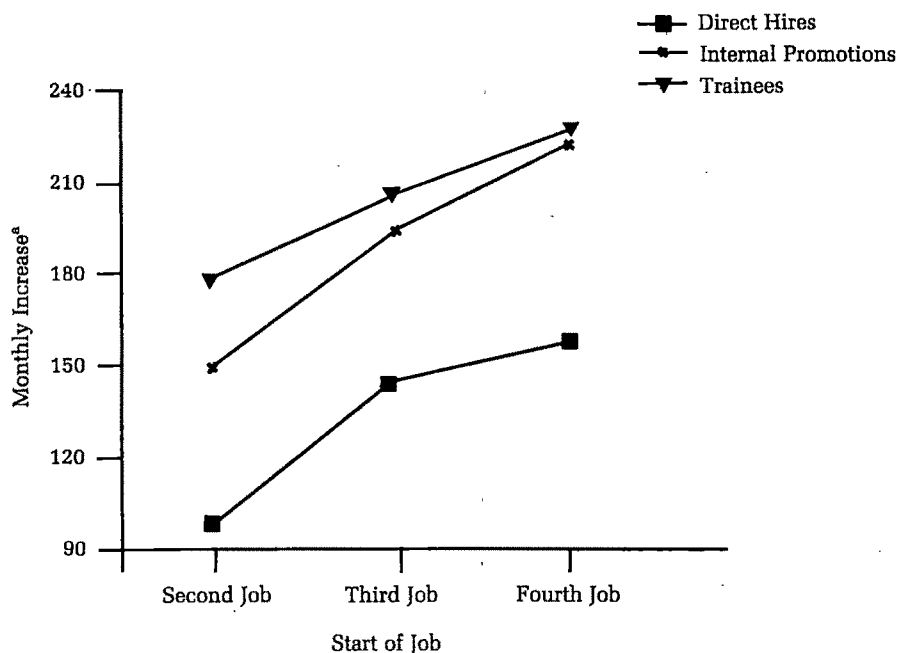
ᵃ Figures are adjusted for annual inflation rates to reflect constant 1987 dollars.

These results should be tempered by noting that the trainees had significantly lower salaries at the start of their careers than other managers. The average salary in a first management job was $25,573 for trainees, compared to $30,486 for those directly hired and $31,248 for those promoted from nonmanagement jobs. Thus, the higher rate of salary progression for trainees represents their catching up from their lower initial starting salaries. The trainees' short half-lives resulted in 31 (33%) of the total 93 trainees moving into their fourth management job during the study period. Their high career mobility helped reduce the initial starting salary gap. The average salaries of former trainees nevertheless remained lower than the salaries of other managers who were at the start of their fourth jobs. Although few directly hired managers (only 32 of the total 166) and very few of those promoted from nonmanagement jobs (only 10 of the total 79) advanced to a fourth management job, those who did advance were able to maintain their initial salary advantage over the trainees.

Hypothesis 4: Fast and Slow Starters

To test Hypothesis 4, we first identified fast and slow starters for each type of career start. The half-life of all trainees in their first management job was 15.2 months, so we designated trainees who spent less than 15.2 months

in their first job as fast starters and the others as slow starters. The directly
hired managers had a half-life of 19.5 months in their first management job,
and those promoted from nonmanagement positions, 24.5 months. We des-
ignated managers whose tenure in their first job was lower or higher than
those half-lives as, respectively, fast and slow starters.

Table 3 reports the mean job tenure the fast and slow starters had in each
job after their first. An ANOVA indicated that fast starters had significantly
($F = 8.2$, $df = 1$, $p < .05$) shorter tenure over all subsequent jobs than the
slow starters. These findings strongly support Hypothesis 4. The fast starters
spent an average 4.3 months less than the slow starters in all jobs held after
their first management job.

Table 4 reports the Hay points associated with the highest management
levels ultimately attained by fast and slow starters. We estimated the Hay
points by linear extrapolation within the range of points assigned to the
highest job level attained. The findings show that fast starters attained higher
levels of management than did slow starters. The ANOVA results ($F = 1.38$,
$df = 1, p = .57$) indicate no significant differences in the Hay points attained
by the fast and slow starters across all career starts. The data in Tables 3 and
4 thus provide mixed support for the hypothesis.

TABLE 3
Average Tenures

Type of Career Start	Fast Starters	Slow Starters[a]
First job		
Trainee	10.13	22.09
Direct hire	11.23	32.95
Internal promotion	17.00	39.65
Second job		
Trainee	14.54	18.30
Direct hire	23.24	24.95
Internal promotion	17.31	23.16
Third job		
Trainee	16.65	22.56
Direct hire	20.44	23.40
Internal promotion	19.84	33.50
Fourth job		
Trainee	11.72	18.63
Direct hire	18.60	22.86
Internal promotion	14.44	
Beyond fourth job		
Trainee	14.19	19.63
Direct hire	16.61	16.75
Internal promotion	6.33	
Average tenure in all jobs		
after the first	17.24	21.58

[a] Blanks indicate there were no slow starters for this type of career start who advanced
beyond a third job.

TABLE 4
Highest Management Level Attained by End of Study

Type of Career Start	Average Hay Points for Last Job Held	
	Fast Starters	Slow Starters
Trainee	341	319
Direct hire	330	326
Internal promotion	312	272

Hypothesis 5: Departmental Power

A contingency table analysis provided strong support for Hypothesis 5. There was a significant association ($\chi^2 = 678.3$, $df = 4$, $p < .01$) between the power of the starting department and the departmental power associated with subsequent jobs held. Although managers received lateral transfers and promotions to new jobs in different departments, only 20 percent of the subsequent jobs were in departments with a power ranking different from that of the starting department. Nearly all subsequent jobs (80%) were held in departments having the same level of organizational power as the location of a manager's career start.

Managers in departments with low power had the highest likelihood of moving to a department in a different power category. Managers holding a job in a low-power department had a 65 percent chance of a promotion or transfer to a new job in the same department, a 4 percent chance of a new job in a different low-power department, and a 31 percent chance of a new job in a medium- or high-power department.

Managers in medium-power departments were the most likely to remain in the same department. There was a 76 percent chance that their next promotion or transfer would be to a new job in the same department, a 17 percent chance that it would be to a new job in a different, medium-power department, and only a 7 percent chance of a new job in a low- or high-power department.

Managers in high-power departments had the highest likelihood of taking a job in a different department within the same power category. There was a 57 percent chance that their next move would be to a new job in the same department, a 30 percent chance that it would be to a new job in a different high-power department, and only a 13 percent chance that the next job would be in a medium- or low-power department.

Hypothesis 6: Departmental Power and Career Mobility

Table 5 reports the tenure half-lives for all jobs held by managers who started their careers in departments having different levels of organizational power. Significant differences emerged ($D = 11.04$, $df = 2$, $p < .01$) in the

TABLE 5
Job Tenure Half-Lives[a]

Type of Career Start	Low-power Departments	Medium-power Departments	High-power Departments	D	df
Trainee	20.65	16.76	15.80	4.2*	2
Direct hire	28.68	23.29	22.52	11.1**	2
Internal promotion	28.08	20.55	26.00	18.1**	2
All career starts	24.84	19.66	19.00	11.1**	2

[a] Tenure is in months.
* $p < .05$
** $p < .01$

survival distributions estimated for the three categories of organizational power, results providing strong support for Hypothesis 6. Managers who started their careers in departments with high power moved through management jobs about six months faster than managers who started their careers in low-power departments. These relative differences in half-lives among high- and low-power departments were consistent, regardless of how the managers had started their careers. The impact of organizational power on the tenure half-lives, however, was largest for managers who started through direct hire or as trainees. Managers who started in medium-power departments had only slightly longer half-lives than those starting in high-power departments.

Hypothesis 7: Departmental Power and Salary Progression

The results in Table 2 show that the power of a starting department had a significant effect on salary progression, supporting Hypothesis 7. Those data also indicate that the interaction effect between power and job sequence approaches statistical significance ($p < .10$), suggesting that the effect of departmental power on salary progression diminished during the later jobs managers held. Figure 5 illustrates the significant main effect on salary progression attributed to the power of a starting department. The monthly salary progression was nearly identical for managers starting in the high- and medium-power departments. Salary progression was initially much slower for those starting in low-power departments, but the power effect diminished after the first job. Starting salaries in first jobs were significantly greater in high-power departments, where the average salary was $29,753, than in low-power departments, where the average salary was $28,120. In addition, salary increments during the first jobs increased nearly $46 per month more in the high-power departments than in the low-power ones. During second and third jobs, however, salaries increased at only $9 to $13 per month more for managers who started in high-power departments compared to those who started in low-power departments.

Because of the longer half-lives associated with starting in low-power

FIGURE 5
Salary Increases per Month of Seniority for Varying Levels of Starting Department Power
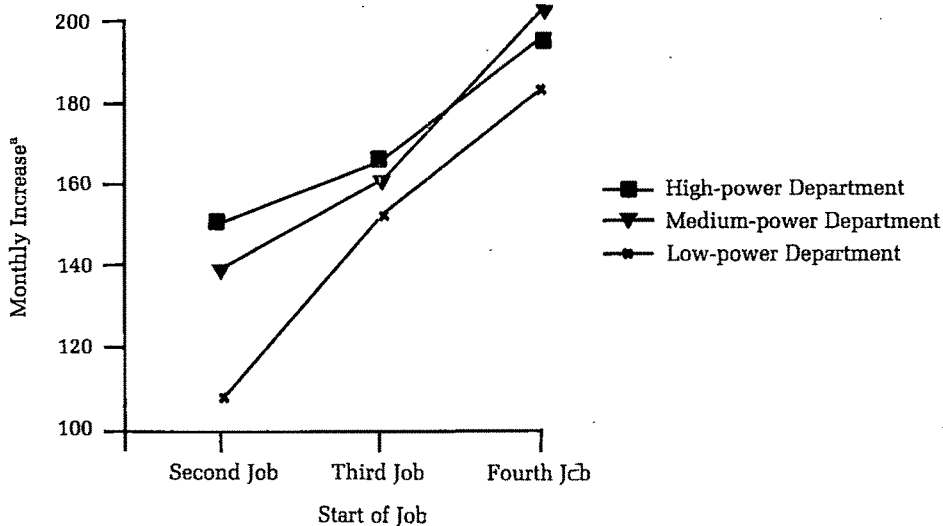
ᵃ Figures are adjusted for annual inflation rates to reflect constant 1987 dollars.

departments, relatively few managers with such starts advanced. Of the 88 managers starting in high-power departments 24 advanced to a fourth job, but only 11 of the 65 managers starting in low-power departments did so. By the start of the fourth jobs, however, there was less than $900 difference in the salaries of managers who had started in high- and low-power departments. Although starting in a high-power department provided an initial boost to a manager's salary, over the long run salary progression depended on the number of jobs to which a manager advanced. For those who successfully advanced, the power of their starting department had little effect on the salaries they were ultimately able to attain.

DISCUSSION

The results of this study expand knowledge of career tournament processes in two important ways. First, previous research has focused largely on the signaling effects of individual characteristics of new employees such as gender, education, and age. The present findings, however, suggest that the job experiences an organization creates in a manager's early jobs have strong signaling effects. Clearly, starting a career as a trainee or in a high-power department propelled managers to move faster along the path of higher career mobility and salary progression than managers who did not have the benefit of these early experiences. Such early organizational experiences

may be even more important than individual characteristics in signaling future career mobility.[2]

The importance of such early career signals looms even larger in light of the growing trend to reduce the number of middle-level management positions in organizations (*Business Week*, 1988). During the past decade, organizations have simply eliminated many of the traditional middle-management jobs that they formerly used to groom managers for top management responsibilities. In the future, organizations may look at career paths in terms of how fast managers move through different jobs rather than how high they advance in what has become a flat management hierarchy in many organizations. Successful new managers may simply "churn" through a number of jobs within a narrow hierarchical range.[3] In the present study, senior managers may have considered trainees to be successful since they spent the shortest time, only a median 16.9 months, in each job. Nevertheless, by the end of the study, the final jobs former trainees held were rated as having an average Hay point value only 80 points above the values of their starting management jobs. Thus, many trainees apparently spent the ten-year period churning through various jobs within a restricted range of the hierarchy.

The salary progression analysis indicated that the company financially rewarded managers who were successful in churning through more jobs, as indicated by the partial correlation between the numbers of jobs held and the managers' total salary increments, with career seniority controlled ($r = .81$, $p < .01$). All those who were successful in churning through at least three jobs reached about the same salary level regardless of the type of career start they had or the power of their starting department. Those factors, however, strongly influenced how fast they moved through jobs.

Second, the results of this study begin to shed light on the logic underpinning this organization's implicit career tournament processes. One reason trainees advanced faster than others may be the strategy of the firm studied. According to the typology Kerr and Slocum (1987) advanced, this firm enacted a "steady state" business strategy. Steady state firms grow through expanding existing businesses into closely related areas and do not

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[2] This study was not designed to test the relative importance of individual attributes versus early organizational experiences as signals of later career mobility. Nevertheless, we conducted a post hoc analysis of individual gender and age influences on career mobility. The results indicated that for each type of career start and departmental power, there were no significant differences in job tenure half-lives between men and women or between managers starting their careers at relatively young or old ages. The empirical results of these analyses are available upon request. These findings suggest that individual characteristics may have less importance as career signals than previous research has attributed to them when the effects of early organizational experiences are accounted for. Estimating the specific weighting of individual and organizational signals, however, remains an important focus for future research.

[3] Maria Nalywayko, the manager of human resources research at the Taco Bell Corporation, called this process "job churning" and suggested the importance of managing it.

seek acquisitions as a means of growth. Their economic survival depends on their ability to compete in their current business. Such commitment to a business requires investments in plants, equipment, and human resources. Several researchers (e.g., Kerr & Jackofsky, 1989; Graddick, 1988; Olian & Rynes, 1984; Slocum & Cron, 1988) have hypothesized that steady state firms need to assure an adequate supply of managers who are capable of understanding the future implications of system-wide decisions.

Firms with a steady state business strategy invest heavily in human resource development programs, which help to ensure that employees understand the total business strategy and that that strategy and culture permeate the entire company. The goal of these socialization programs is to ensure that the organization identifies employees with managerial talent early and develops them through the kinds of experiences they need to move successfully into higher levels of management. This process requires an intensive management development effort during which senior managers acting as mentors transfer important values to new managers.

An interesting signaling tactic for communicating a corporate philosophy occurs when new employees enter a firm According to Schein (1978) and Zahrly and Tosi (1989), training programs are one vehicle for implementing a firm's strategy. Even though trainees are later dispersed into various departments, it is critical that new employees hear a common message that they can rally around. Trainees are eager to make a contribution when they first enter a firm. Organizations make every effort to capitalize on this enthusiasm by helping trainees understand how they can make the business a success and at the same time grow professionally.

Transfers and promotions are other key tactics. Career moves among powerful functional departments provide managers with an opportunity to learn about the key success factors critical to a steady state strategy and also establish effective networking. Networking in high-power departments serves to psychologically integrate individuals into an organization (Kerr & Slocum, 1987). By participating in trainee programs and being assigned to powerful departments early in their careers, new managers are effectively socialized into the culture of an organization.

Although such sponsorship signals and career path tracking help create an efficient selection system consistent with a steady state corporate strategy, these selection factors have inherent risks as determinants of career mobility. One risk is that organizations typically make these decisions at the very start of a person's career. The decision to sponsor a job candidate as a trainee is made after only a few hours of interviews. Likewise, trainees go into high- or low-power starting departments after only two months of orientation. Yet these decisions have far-reaching implications for managers' future mobility and career paths.

Sponsored individuals are repeatedly tested in job competitions early in their careers. Those who fail to meet high expectations remain in jobs longer than others. Questionable performers receive a longer look in each job they hold. Human resource managers should take care to establish corporate-

wide systems to identify management talent and provide appropriate mobility signals for talented individuals who were not sponsored at the start of their careers or placed in high-power departments.

Another risk is that there is little chance for late bloomers in the tournament model. The distributions of transfer and promotion hazard rates found here indicate that the probability of a manager being transferred or promoted peaked between 24 and 48 months job tenure and then declined rapidly. It was near zero after a manager had been on a job longer than four years. The existence of this peak period for transfer and promotion may influence managers to take a short-run perspective in their decision making that could be detrimental to an organization's long-term goals, particularly in a company following a steady state business strategy (Kerr & Slocum, 1987). To counteract the short-run orientation the tournament process encourages, an organization should establish controls that hold managers accountable for the long-run impact of their decisions.

Lastly, a note of caution must be sounded regarding the generalizability of these research findings. Earlier, we noted that Rosenbaum's (1984) study also contained such a caveat. The present research confirmed all the hypotheses the tournament model suggests and indicates how tournament processes are consistent with the corporate strategy of the firm studied. However, the results of two studies—Forbes (1987) and the present research—conducted in two different organizations do not represent conclusive support for a theory. There is an obvious need for more long-term longitudinal research of career mobility in other organizations, particularly firms following different corporate strategies.

Ten-year studies within one organization are obviously time-consuming and fraught with inherent limitations. For example, the field applications of survival analysis assume that the starting times of the individuals studied will be random. Large shifts in a company's hiring rates during a study period or exogenous disturbances that might drastically alter people's internal career moves would violate that assumption and greatly confound the interpretation of a survival analysis. Likewise, any extended longitudinal research assumes that the phenomena under investigation are stationary or at least in some form of equilibrium. Any changes in corporate strategy that alter normal hiring patterns in different departments will greatly confound the longitudinal study of tournament processes. Variation in hiring rates occurring in different departments, rather than the tournament effects posited to occur across departments, may account for differences in career mobility patterns. We had no reason to suspect that either of these confounding factors arose in this research. Unfortunately, field researchers have no way to control these exogenous disturbances. Researchers may be well into a ten-year study before they realize that their design is flawed because of events beyond their control. However, taking prudent research risks appears warranted if researchers are to build dynamic flow models that will help explain career mobility patterns over time.

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EFFECTS OF MONITORING AND TRADITION ON COMPENSATION ARRANGEMENTS: AN EXPERIMENT WITH PRINCIPAL-AGENT DYADS

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An experiment tested the theory that behavior monitoring and the pres-
ence of a tradition of noncontingent pay would interact to affect com-
pensation agreements in principal-agent dyads. On the basis of the no-
tion that risk takers can command premiums, we also predicted that
agents who accepted contingent pay would earn more than those who
did not. Finally, we predicted that the presence of a tradition of non-
contingent pay would anchor both the form and amount of agent earn-
ings. Data collected from 40 dyads supported all three predictions. Fur-
ther, we observed that the impact of tradition exceeded that of moni-
toring and became stronger over time. The study has implications for
predicting the features of compensation agreements and understanding
the impact of traditions on levels of earnings.

Compensation has a major role in modern perspectives on organiza-
tional control. In economic theories, compensation is the primary mecha-
nism for aligning the often divergent interests of managers and owners
(Jensen & Zimmerman, 1985). According to the economic model, organiza-
tions should design compensation systems so that managers are well off to
the extent that owners are also well off. Therefore, in an economically ra-
tional compensation system, executive pay should be positively related to
corporate performance. Contrary to the economic prediction, however, busi-
ness periodicals have frequently commented on the lack of a relationship
between executive compensation and company performance (*Business
Week*, 1987; *Wall Street Journal*, 1985). A flurry of recent academic research
has sought to examine the relationship between executive compensation and
organizational performance precisely. Studies finding a relationship be-
tween compensation and indicators such as returns to shareholders (Mur-
phy, 1985), accounting decisions (Healy, 1985), and mergers (Kroll, Sim-
mons, & Wright, 1989) have generally supported the economic model. None-

theless, the total amount of variance in executive compensation that performance has explained has seldom exceeded 15 percent (Tosi & Gomez-Mejia, 1989).

Kanter (1987) identified an increase in business organizations' use of performance-contingent compensation, suggesting that many organizations are attempting to increase the relationship between performance and pay. According to Kanter, organizations are designing programs that tie pay to performance measured at an individual, group, or organizational level. Until recently, most organizations designed pay programs so that most of the variation in individual compensation was tied to the job and organizational level an individual occupied. Kanter suggested that the trend toward performance-contingent pay presents a serious challenge to the relationship between pay and hierarchical level. By coupling pay to performance, organizations can create situations in which subordinates earn more than their superiors. In part, the absence of large correlations between executive pay and performance may reflect the reluctance of executives to violate the traditional hierarchical order. The present study explored the interaction between the existence of a tradition of noncontingent pay in a firm and the owner's ability to monitor employees—a key variable in efficiency models—on the negotiation of agreements involving contingent pay.

Modern economic perspectives on organizational control generally support the use of performance-contingent pay. Agency theory (Eisenhardt, 1989; Jensen & Meckling, 1976), currently the dominant economic control perspective, prescribes the use of performance incentives for agents (a firm's employees) when their principal (its owner) cannot observe their actions. Agency theory distinguishes between agents' behaviors and the outcomes of their performance, typically designating the latter as the financial consequences of the agents' behaviors. Given efficiency as a criterion, the distribution of information about agent behavior and its costs determine the viability of both hierarchical and incentive forms of control (Baiman, 1982). For example, when the costs of directly monitoring an individual's actions exceed the costs of administering incentives based on performance outcomes, performance-contingent incentives are a preferred method of control.[1] Viewed through the lens of agency theory, the trend toward contingent pay suggests that some organizations are discovering that incentives may be more efficient than hierarchy.

As Kanter observed, the demand for efficiency may conflict with the existing traditions, or institutions, of organizations. Although the compensation practices that the values of efficiency and tradition support need not conflict, under some circumstances they might. In one such case, institu-

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[1] The familiar piece-rate incentive plans sometimes used in manufacturing jobs are a practice that is inconsistent with the principles of agency theory in that agents' behaviors are monitored yet performance incentives are offered. However, unlike most executive compensation plans, piece-rates are based on an ex ante rather than an ex post estimation of economic benefits.

tionalized pay practices may reflect strategies that were efficient in the past but are no longer appropriate (Meyer & Rowan, 1977; Zucker, 1977). Because of a time lag between the need for administrative change and its implementation, institutionalized pay procedures may never perfectly meet the efficiency demands placed on them. Established practices may become so firmly embedded within the social structures of organizations that changes occur very slowly, even when there are strong economic reasons for making them (Granovetter, 1989). Alternatively, organizations can institutionalize practices for reasons other than efficiency—for example, conforming to the desires of powerful organization members—and, therefore, the practices adopted may not be economically efficient (Tolbert & Zucker, 1983).

AGENCY THEORY, TRADITION, AND COMPENSATION PRACTICES

Eisenhardt (1985, 1988) compared the institutional and agency perspectives on organizational control using cross-sectional data from retail stores. Using proxy variables reflecting the costs of monitoring and an industry's or a firm's pay traditions, she found that the forms of compensation contracts governing retail salespeople were significantly related to both types of variables. She concluded that both agency and institutional variables could predict the form of compensation used to control retail salespeople.

The present study extended Eisenhardt's research using a somewhat different perspective and methodology. Eisenhardt's research examined the validity of agency and institutional perspectives for predicting compensation policy. This study examined both the main and interactive effects of monitoring and tradition over time. We examined the effects of these factors on the form compensation took, the earnings of agents, and the communications taking place in principal-agent dyads.

Following agency theory, we anticipated that principals and agents would consider information costs and risks and that therefore the ability of a principal to monitor an agent's contributions would affect the contracts negotiated between the parties. In particular, agents, whom agency theory assumes to be risk-averse, should always prefer certain, noncontingent forms of compensation. When principals can observe or monitor the efforts of agents at little or no cost, they are most likely to acquiesce to the agents' preferences for noncontingent forms of compensation. However, when monitoring is not possible, principals will prefer contingent forms of compensation—compensation based on the performance of the dyad—and are more likely to negotiate to obtain them.

> *Hypothesis 1: Performance-contingent compensation is more likely than noncontingent compensation when principals cannot monitor agents' efforts.*

Traditions should also affect the form of compensation principals and agents negotiate. The tradition manipulated in this study favored the use of noncontingent compensation. We expected the presence of a traditional pay practice to support the legitimacy of noncontingent pay and lead to its extensive use in the dyads.

> *Hypothesis 2: Noncontingent ccmpensation is more likely*
> *to occur than contingent compensation in the presence of*
> *information that other, similar firms have traditionally*
> *used noncontingent pay.*

Eisenhardt's (1988) study provided support for the first two hypotheses but did not test the interaction between monitoring and tradition. The use of several correlated proxy variables to indicate monitoring and tradition and the ordinal scaling of some of those measures made detecting an interaction extremely difficult with her data. Our third hypothesis predicts an interaction between monitoring and tradition. We expected the presence of a noncontingent pay tradition to decrease the predicted effect of monitoring for several reasons. First, agents, who theoretically always prefer noncontingent pay, could argue that noncontingent compensation is legitimate because other firms in their industry use it. Second, principals would be likely to accept the noncontingent form, regardless of monitoring capabilities, because of the legitimating effects of tradition (Zucker, 1977). Finally, we anticipated that principals might accept noncontingent pay as a ready solution to the problem of establishing a form cf compensation (Cohen, March, & Olsen, 1972) and not think further about its appropriateness if the behavior of their agents was visible (Tolbert & Zucker, 1983).

> *Hypothesis 3: A tradition of noncontingent pay and mon-*
> *itoring capability will interact so that the effect of moni-*
> *toring on the use of contingent compensation will be*
> *smaller when the tradition is present than when it is ab-*
> *sent.*

Agent Earnings

The earnings of agents were also of interest in our study. When agents' pay is contingent on outcomes, the agents assume a portion cf the market risk that affects their firms. Consequently, a contingently paid agent may demand a premium in return for accepting a portion of the risk that the principal would otherwise bear. Such a risk premium does not depend on an agent's effort or performance; rather, it is a payment for accepting the uncertainty of the market. The willingness of principals to pay demanded risk premiums should depend on the cost of the alternatives, such as replacing the agent, investing in monitoring capability, or selling the firm. Usually those costs are high and principals will seek a lower cost compensation alternative.

> *Hypothesis 4: With performance controlled, the total*
> *earnings of an agent will be positively correlated with the*
> *proportion of pay earned by the agent on a contingency*
> *basis.*

We have also argued that compensation traditions reduce changes in the form of a compensation agreement between a principal and an agent. This anchoring may also affect the amount of compensation agents receive. If both the absence of a risk premium and the anchor of tradition reduce agent

earnings, we would expect the total compensation of agents working under a noncontingent tradition to be lower than that of agents whose compensation agreements are not so anchored.

> *Hypothesis 5: The presence of a tradition of noncontingent pay will hold down agents' earnings compared to the absence of that tradition.*

Communication Patterns

Agency and institutional theory yield reasonably straightforward predictions about compensation outcomes. We theorized that manipulating monitoring and tradition might also affect communication and negotiation between principals and agents. Although the two theories do not make unequivocal predictions about the communication that will take place between the parties, we can specify several possible relationships.

Monitoring can be expected to affect the amount of negotiation. When monitoring is available and low in cost, principals should be relatively indifferent to agents' demands for noncontingent, low-risk compensation. Agents, because they are risk-averse, will prefer a certain payoff to a riskier contingent payoff. When monitoring is not feasible, however, the preference of principals and agents should be in conflict, which should increase the amount of negotiation between them. A second and somewhat different effect of monitoring may also occur. Principals who can observe agents' efforts may be in a better position to advise and collaborate with them. When monitoring is possible, therefore, more communication oriented toward problem solving should occur than when monitoring is not possible.

A tradition of noncontingent pay may also affect communication in principal-agent dyads. For example, since such a tradition should increase the acceptability of contingent compensation for both agent and principal, the amount of negotiation between them should be lower when it is present than when it is absent. But its absence may also increase communication, particularly early in a dyad's history, when solutions to the compensation problem are being sought and are not readily available in the form of a tradition.

On an exploratory basis, we collected and examined information about the communication between principals and agents in a laboratory setting. The information we collected included who initiated each communication and its basic content. In particular, we coded communications according to their function as either negotiation or information exchange. Our objective in collecting and analyzing the communication data was to evaluate how the experimental manipulations we performed affected interactions between principals and agents.

METHODS

Subjects

The subjects in this study were recruited from two populations. The principals were 40 M.B.A. students who participated in the study in return

for extra credit in an organizational behavior class. The agents were 40 undergraduate business students (juniors and seniors) for whom participation was an alternative to a homework assignment in an organizational behavior class. We randomly assigned subjects to principal-agent dyads and randomly assigned the dyads to four experimental conditions in which the presence of a noncontingent pay tradition and monitoring capability varied. All subjects knew that the agents were undergraduates and that the principals were graduate students, but the members of dyads were unaware of each others' identity before, during, and after the experiment.

Separate populations were used for principals and agents for two reasons. First, agency theory implies that principals have greater discretion in employing their assets and a higher socioeconomic status than agents. Using M.B.A. candidates in the principal role helped establish status differences between the principals and the agents in our study. Second, using two subject populations reduced the chance that principals and agents could identify each other during the study.

The Experimental Task

The experimental task simulated an agency relationship. In order to examine our hypotheses, the task had to have six features. Five of these were aspects of the structure of an agency relationship, and sixth was necessary to examine both our hypotheses and the negotiations of the principal-agent dyads.

First, agency theory required that there be a principal and an agent. We used a computer-based management simulation called the Algebra Company in which each dyad was a two-person firm with an owner-manager (the principal) and a product manager (the agent). Each firm started with an initial cash reserve of $30,100, divided into starting budgets of $30,000 for the principal and $100 for the agent.

Second, agents acted on behalf of principals. The dyads "manufactured" solutions to algebraic equations by purchasing information about the values of the variables in the equations, and a computer-simulated market bought the solutions. The purchase price increased with the accuracy of a solution.

The principals' and the agents' responsibilities in solving the equations differed. In the beginning of each trial, the dyads received a three-variable equation to solve (e.g., $y = a + b$). The agents purchased estimates of b using funds from their personal budgets. The accuracy of the estimates agents received increased monotonically with the amount they spent for the information, which could be anything from $1 to $100, each agent's total budget. The computer subtracted the price of an estimate from the agent's budget. Once the agent had received an estimate and possibly revised it, the individual submitted it to the computer as the dyad's estimate of b. The principals' task was easier than the agents'. Principals purchased information about the a variable in the equation as a fixed overhead payment and were instructed to always pay $100 for this estimate, which was always perfectly

accurate. Principals were told that the dyad's revenues largely depended on the agent's estimates of b and that their job was to influence their agent, using communications, pay, or both, to produce the largest possible revenues. All of a dyad's revenues went to the principal's budget. After receiving revenues at the end of each trial, principals paid the agents by transferring funds from their personal budgets' to the agents' budgets. The computer informed the agents about these transfers.

Third, the incentive structure promoted self-interested behavior. Agency theory assumes that people are self-interested. We provided the agents with financial incentives to maximize their personal budgets. The agents with the largest personal budgets at the end of the experiment received cash prizes of $25, $15, or $10. All other agents were entered into a raffle for several $5 prizes, and given one chance in the raffle for each dollar of their final budget. Since the amounts paid to purchase information and the amount of pay received from their principals jointly determined the sizes of agents' final budgets, they had incentives to minimize the amount spent for information and to negotiate higher pay from the principals. The amount the agents paid for information was a measure of their contributions on behalf of their principals. Agents had complete control over the amount paid for estimates but had to negotiate with their principals for pay.

The financial incentives offered to the principals were the same as those for the agents and favored the maximizing of personal budgets. However, unlike the agents' purchases, the principals' information purchases reflected a fixed overhead cost and were unrelated to budget maximization. Instead, principals faced the complex task of maximizing their budgets through controlling the agents' information purchases. The best strategy for a principal was to pay an agent the minimum necessary to allow the agent to make revenue-maximizing information purchases.

Fourth, returns to dyads depended on both the agents' estimates and market risk. The production system created in the simulation solved the equations by combining estimated values of a and b. The accuracy of the product, y, was monotonically related to the accuracy of b, which was in turn monotonically related to the amount an agent spent for an estimate. However, a random, computer-generated component representing market risk also affected the returns to the dyads. Therefore, returns were not perfect indicators of agents' contributions.

Fifth, principals compensated agents for their contributions. Principals and agents were free to negotiate the amounts and terms of payment. Payments were made by budget transfers, which the computer tracked. In addition, principals were required to complete worksheets to verify their funds transfers. These forms showed total compensation as well as the portions contingent and not contingent on revenues.

Finally, the task allowed direct communication between principals and agents. The computer allowed the parties to communicate in writing and recorded complete transcripts of these communications. We used these tran-

scripts for the exploratory communications analysis as well as to cross-check the amounts of contingent and noncontingent compensation principals declared.

Procedures

Subjects sat at computers logged into one of the four experimental conditions. Each dyad completed 25 trials of the Algebra Company simulation. In each trial, a dyad received an equation, the agent purchased an estimate of b, and the principal received an estimate of a in return for the $100 overhead payment. The principal and agent then submitted the estimates to the computer, which evaluated the accuracy of the resulting y, calculated returns, and paid the principal, who then paid the agent through an electronic budget transfer.

The principals determined the amount and terms of the compensation paid to their agents after communication and negotiation between them, which could take place at any time during or between trials. Both principal and agent had complete information about the revenues the principal received following every trial. Although the agents always knew what they spent for estimates, the principals only knew the amount spent by the agents with certainty when monitoring was permitted.

Manipulations

Behavior monitoring. The ability of principals to observe agents' expenditures was experimentally manipulated. Each dyad was assigned to one of two conditions with respect to monitoring. Principals in the no-monitoring condition could not observe the agents' expenditures. Principals in the monitoring condition could request and receive information from the computer regarding agent expenditure for the previous trial.

Although every principal could monitor the outcome of an agent's purchases by observing firm performance, that information did not necessarily accurately indicate an agent's contributions because of the random market effect. Agents who could be monitored were told so in their experimental instructions; however, they had no way of knowing when they were being monitored. Principals who had monitoring capability monitored their agents an average of 23.38 times over the 25 trials.

Tradition. The presence or absence of a tradition of noncontingent pay was manipulated in the instructions dyads received before the first trial. When a tradition was present, the information supplied to both the principals and the agents indicated that "the traditional compensation arrangement in the industry between principals and agents is a flat salary of $100 per period." The principals and agents were further advised that "due to changing market conditions, this compensation arrangement may or may not continue to be appropriate" and that if it was determined to be inappropriate, they should negotiate a new compensation agreement. When the tradition was absent, subjects received no cues about compensation and were

simply advised that "one of your tasks is to negotiate an appropriate compensation arrangement."

Compensation agreements. Subjects were encouraged to negotiate mutually satisfactory compensation arrangements. In the event that they could not reach a satisfactory agreement, both principals and agents had the option of quitting the game and having a preset amount of money deposited into their accounts for the remaining trials of the game. For a principal, this option was equivalent to selling the firm, and for an agent, it was equivalent to alternative employment. In addition, agents could go on strike by spending the minimum on their information purchases ($1), which yielded very inaccurate estimates that rarely resulted in a profit. These options assured that both parties had leverage in negotiations. Although no principal or agent actually quit the game, four agents employed strike strategies on a total of 12 trials.

Manipulation checks. Six items were included in post-experimental questionnaires to evaluate the effectiveness of the tradition and monitoring manipulations. Both principals and agents answered three items evaluating the perception that a tradition existed, and the principals answered two items assessing their ability to observe the agents' expenditures. Finally, one item assessed the agents' beliefs that their expenditures could be monitored. Answers to all six items were on a 7-point Likert-type scale.

Dependent Measures

Testing Hypotheses 1 through 3 required measuring whether the compensation paid was contingent upon performance or noncontingent. Using the budget transfers, the transcripts of communications, and the compensation sheets the principals completed, we observed the amount and form of compensation the agents received.

The measure of the form of pay, called contingent pay, was calculated as $(C_t - N_t)/R_t$, where C_t was the contingent pay paid to the agent on trial t, N_t was the noncontingent pay paid on trial t, and R_t was the total revenue a dyad earned on trial t.[2] A positive value indicated that the amount of contingent pay exceeded that of noncontingent pay, a negative value indicated that the amount of noncontingent pay was larger, and a value of zero indicated that the amounts of contingent and noncontingent pay were the same. We aggregated the measure to five-trial blocks for analysis.

Agent earnings, used to test Hypotheses 4 and 5, was simply the amount of compensation a principal paid an agent on each trial, or $C_t + N_t$. We also aggregated the earnings measure to five-trial blocks for analysis.

From the transcripts of all communication between the principals and the agents, we classified the messages into two categories, negotiations and

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[2] The contingent pay measure indicates the amount of contingent pay received by an agent as a proportion of total revenues on each trial. We also calculated a second measure which examined contingent pay as a proportion of the total pay received by an agent on each trial. The latter measure was highly correlated with the former and led to similar patterns of results.

information. We further divided the exchanges in the negotiations category, which were communications related to bargaining about compensation, into three categories. *Offers* and counteroffers made by principals and *demands* and counterdemands made by agents were proposed compensation agreements. *Concessions* were agreements by either party to accept a previous offer or demand. In a typical demand, one agent said, "I can no longer accept the current base salary. I want $100 base salary plus 10% commission." The answer, a typical concession, was, "Okay, that sounds good to me. A base of $100 and still keeping the 10% commission it is." The third category, *information*, captured communications in which a party either asked for or gave data. For example, in one dyad the principal gave the following information to the agent: "I am sure you realize the importance of sales. Your sales have declined this period and I hope this will not continue." In another dyad, the agent asked the principal, "How about a little information as to where we are on sales, please?" Two undergraduate student coders, who were blind to the hypotheses, experimental conditions, and other details of the study, independently assigned 89.3 percent of the communications to identical categories. An investigator who was blind to experimental condition resolved their disagreements.

RESULTS

Manipulation Checks

To evaluate the effectiveness of the manipulations of tradition and monitoring, we created two scales. Table 1 displays the results for these scales by condition. The analysis showed that the tradition manipulation produced a significant main effect in the expected direction on the subjects' perceptions of the presence of a tradition of noncontingent compensation ($F_{1,35} = 5.56$, $p < .05$). There were no significant interaction effects. We also found a significant main effect in the expected direction for monitoring ($F_{1,34} = 53.89$, $p < .001$). Principals with monitoring capability were aware that they were able to monitor the actions of their agents, and their agents were aware of the principals' capability. Once again, there were no significant interactions.

Tests of Hypotheses

Table 1 also shows the means for earnings and for contingent pay. Hypothesis 1 predicted that more of the compensation paid to an agent would be contingent on outcomes when monitoring was not possible, and Hypothesis 2 predicted that noncontingent compensation would be more likely to occur in the presence of a noncontingent compensation tradition. Hypothesis 3 predicted an interaction between the two factors. To test these hypotheses, we used a repeated measures analysis of variance (ANOVA), with monitoring and tradition as between-subjects factors and the sequential five-trial blocks as a within-subjects variable. The ANOVA revealed several significant effects: a main effect for trial blocks ($F_{4,144} = 9.78$, $p < .001$), an

TABLE 1
Overall Means[a]

	Conditions				Magnitude of Effect[c]	
	No Tradition		Tradition			
Variables[b]	No Monitoring	Monitoring	No Monitoring	Monitoring	Tradition	Monitoring
Manipulation Checks						
Tradition	2.46	2.85	3.53	3.05		
Monitoring	2.96	5.50	3.37	5.57		
Contingent pay						
Trials 1–5	.095 [.337]	.008 [.087]	−.001 [.024]	.019 [.036]	.20	.13
Trials 6–10	.262 [.455]	.012 [.083]	.003 [.041]	.051 [.082]	.24	.20
Trials 11–15	.314 [.453]	.040 [.092]	−.001 [.079]	.071 [.105]	.31	.15
Trials 16–20	.310 [.455]	.060 [.097]	−.010 [.098]	.087 [.123]	.33	.09
Trials 21–25	.317 [.469]	.107 [.156]	−.021 [.126]	.110 [.128]	.43	.03
Overall	.260 [.423]	.045 [.088]	−.006 [.071]	.068 [.091]		
Earnings						
Trials 1–5	1,265 [1,006]	928 [664]	159 [182]	299 [302]	.87	.01
Trials 6–10	1,865 [1,084]	1,344 [636]	345 [362]	672 [709]	.33	.02
Trials 11–15	2,443 [1,543]	1,562 [597]	547 [624]	992 [888]	.72	.02
Trials 16–20	2,333 [1,496]	1,931 [898]	673 [754]	1,170 [1,054]	.82	.00
Trials 21–25	2,361 [1,455]	2,152 [1,140]	894 [940]	1,404 [1,065]	.81	.01
Overall	2,053 [1,260]	1,583 [594]	523 [550]	907 [764]		

[a] Standard deviations are in parentheses. $N = 10$.

[b] Contingent pay is shown as a percentage of revenues. Agents' earnings are rounded to the nearest dollar.

[c] We computed ϖ^2 for each of the five-trial blocks for both tradition and monitoring.

interaction between monitoring and tradition ($F_{1,36} = 4.17$, $p < .05$), an interaction between tradition and trial block ($F_{4,144} = 3.96$, $p < .05$), and a three-way interaction (monitoring by tradition by trial block, $F_{4,144} = 4.45$, $p < .05$). Figure 1 shows the trends in the contingent pay variable plotted by experimental condition and across trial blocks. Results did not support Hypotheses 1 and 2. There were no significant main effects for monitoring or tradition, although the mean levels of contingent pay differed in the expected direction across the tradition conditions. The overall means for contingent pay (Table 1) show the data most relevant to Hypothesis 3, which the significant monitoring-by-tradition interaction supported. The data clearly show that when monitoring was not possible and tradition was absent, the amount of contingent compensation was much greater ($\bar{x} = .26$) than when monitoring was possible ($\bar{x} = .05$). The data also indicate that when a tradition was present, the effect of monitoring disappeared. Although the mean difference attributable to monitoring for subjects in the tradition condition was the reverse of that found in the no-tradition condition, the means in the no-tradition condition ($-.006$, and $.068$) were not significantly different from each other at the $p < .05$ level. Therefore, the interaction indicated that the monitoring effect predicted in Hypothesis 1 occurred only in the absence of a tradition. Similarly, the tradition effect predicted by Hypothesis 2 was strong only when monitoring was not possible.

The additional significant effects obtained on the contingent pay variable are also noteworthy. The significant three-way interaction between monitoring, tradition, and trial block indicates that the two-way interaction became more powerful over the trials, as is clear from the spreading shape of the curves in Figure 1. The significant two-way interaction between tradition and trial block indicates that the effect of tradition, which tended to reduce the amount of contingent compensation paid to an agent, became more powerful over time. The increases in the size of the tradition effect calculated within each trial block (Table 1) strongly support this interpretation. Both results are important since they show that the tradition had more than an initial anchoring effect on type of compensation. In particular, these results suggest that the tradition manipulation affected the rate of growth over time of the relative amount of contingent compensation. Finally, the main effect for trial block indicates that, overall, the amount of contingent compensation paid to agents tended to increase over time.

Hypotheses 4 and 5, concerning the agents' wealth, were examined with the earnings variable. To test Hypothesis 4, we examined the correlations between contingency pay and agent earnings, controlling for agent performance, or error in estimating b. The first-order correlations in each five-trial block were 0.11, 0.37, 0.46, 0.42, and 0.43. All but the first of these were statistically significant at the $p < .05$ level. The statistically significant correlations between earnings and contingent pay supported the hypothesis: Agents earned more to the extent that they accepted contingent contracts. This result is consistent with the theory that agents will receive a risk premium in return for accepting contingent pay.

FIGURE 1
Trends in Contingent Pay
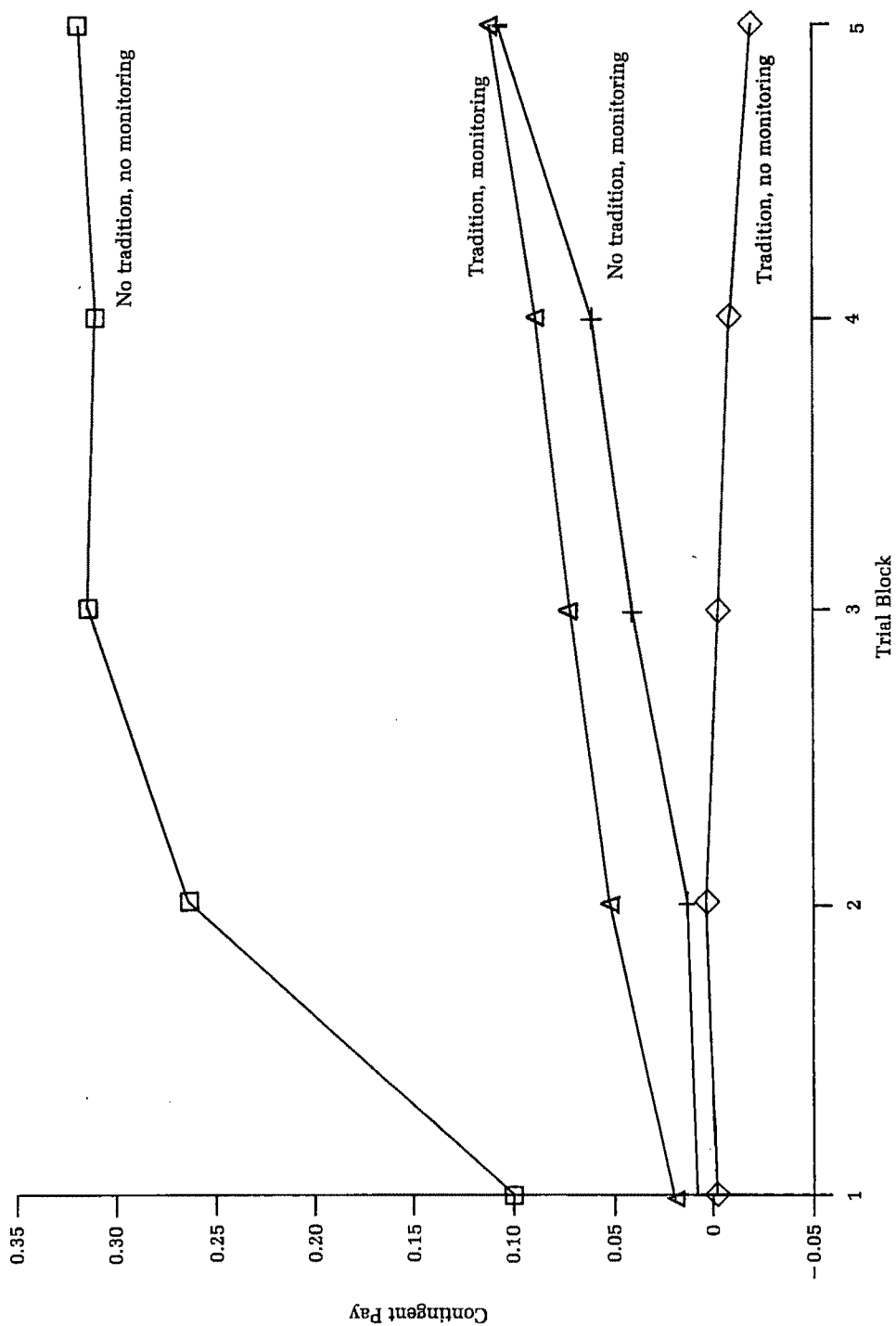
To test Hypothesis 5, we conducted an ANOVA on the earnings variable. The ANOVA revealed significant effects for both tradition ($F_{1,36} = 17.19$, $p < .001$) and trial block ($F_{4,144} = 29.26$, $p < .001$) on the agent earnings variable. Figure 2 shows plotted earnings data. The significant main effect of tradition on agent earnings supported the hypothesis: Agents earned an average $1,818 per period in the absence of a noncontingent tradition and an average $712 when the salary tradition was present. The significant effect of trial block indicated that agent earnings increased over time.

Communication

Table 2 presents the data on communications, which show both an overall view of the dyadic exchanges and a breakdown in terms of which party initiated each exchange. Overall, negotiation-related exchanges accounted for about one-third of the interactions and were fairly equally divided between those initiated by a principal and those initiated by an agent. However, agents initiated two to three times more information exchanges than principals, and more of the information exchanges asked for than gave information. The number of discrete negotiation episodes—exchanges resulting in a change of compensation, most clearly indicated by the concession category—was about the same across the four experimental conditions, although subjects in the no-monitoring, tradition-present condition had about 20 percent fewer episodes than the other three. This section describes two trends apparent in the data.

The first trend was that the total amount of information exchanged differed across the four experimental conditions. Subjects in the monitoring, no-tradition condition made 530 exchanges, over four times more than those in the no-monitoring, tradition condition (125 exchanges). Further, the ordering of the data suggests that the presence of monitoring and the absence of a tradition facilitated information exchange, with the effect of the former being somewhat larger.

The second trend concerned concession behavior. In a concession, either a principal agreed to an agent's demand or an agent accepted a principal's offer. The data suggested that the tendency of principals to concede to agents' demands was lowest for subjects in the no-monitoring, no-tradition condition ($x = 7$) and highest in the two monitoring conditions ($x = 18$). Conversely, agents conceded most often in the no-monitoring, no-tradition condition ($x = 35$) and least in the monitoring, tradition condition ($x = 15$).

DISCUSSION

This study provides insights into three areas of principal-agent relationships: the compensation arrangements that emerge between principals and agents, the earnings of agents, and the communications that occur between the two parties. The controlled laboratory methodology allowed us to examine trends in compensation over time and to evaluate the interaction between monitoring and tradition precisely.

FIGURE 2
Average Agent Earnings
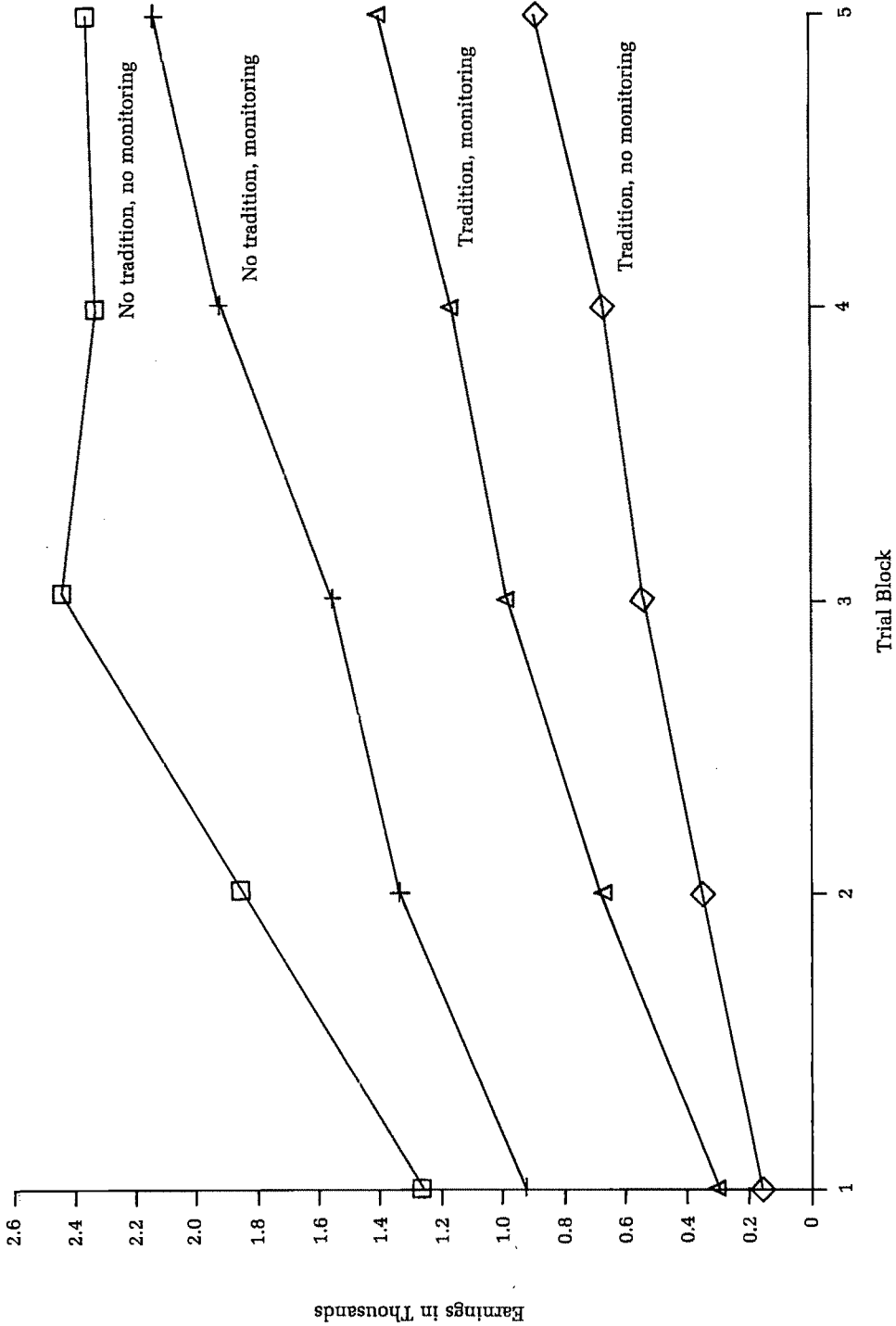
TABLE 2
Summary of Negotiation Processes[a]

Variables	Dyads				Principals				Agents			
	No Tradition		Tradition		No Tradition		Tradition		No Tradition		Tradition	
	No Monitoring	Monitoring	No Monitoring	Monitoring	No Monitoring	Monitoring	No Monitoring	Monitoring	No Monitoring	Monitoring	No Monitoring	Monitoring
Negotiations												
Totals	132 (32)	163 (23)	134 (52)	164 (33)	51	77	60	79	81	86	74	85
Offers and demands	90 (22)	118 (17)	98 (38)	131 (26)	44	59	47	61	46	59	51	70
Concessions	42 (10)	45 (6)	36 (14)	33 (7)	7	18	13	18	35	27	23	15
Information												
Totals	284 (68)	530 (77)	125 (48)	337 (67)	91	145	48	129	193	385	77	208
Giving	104 (25)	144 (21)	69 (27)	97 (19)	48	91	40	70	56	53	29	27
Asking	180 (43)	386 (56)	56 (21)	240 (48)	43	54	8	59	137	332	48	181
Overall totals	416	603	250	501	142	222	108	208	274	471	151	293

[a] Figures in parentheses show classification as a percentage of total interactions. Percentages are rounded to the nearest whole number. The interrater reliability of content classifications was 89.3 percent.

Compensation Policy

Eisenhardt (1988) found support for explanations of compensation policies that drew on both monitoring and tradition. Like Eisenhardt, we found that the ability of a principal to monitor an agent decreased the use of performance-contingent pay. However, as the significant tradition-by-monitoring interaction suggests, we obtained this result only when a pay tradition was not present. Also like Eisenhardt, we observed that tradition influenced the use of noncontingent pay in the negotiated compensation policy; however, the interaction indicated that this effect was strong only in the conditions in which principals could not monitor agents. In addition, the significant tradition-by-trial interaction indicated that the effect of tradition increased over time, accounting for 20 percent of the variance in contingent pay on the first block of trials and 43 percent on the final block. Our failure to completely replicate Eisenhardt's (1988) results was not surprising. The design of this study provided a more powerful test of the interaction hypothesis than Eisenhardt's study, in which measurement and correlated predictors made interaction effects virtually undetectable.

As did Eisenhardt, we concluded that the rational consideration of technological and economic factors and the acceptance of pay traditions that may or may not be economically appropriate affect compensation policies. We also concluded that the existence of a pay tradition can inhibit the economically rational thinking agency theorists assume. The results suggest that the effects of tradition are relatively powerful and unlikely to diminish over time.

Agent Earnings

We predicted and found that, with performance held stable, agents would earn more when they were willing to accept contingent compensation. We also predicted and found that a tradition of noncontingent pay anchored the level of agent earnings and persisted over time. In this study, the basic noncontingent pay specified was low, so the agents were better off without the tradition. From these results, we concluded that principals will pay more to risk-seeking agents who accept performance-contingent pay. We also concluded that agents will be best off economically when (1) traditions support contingent pay and (2) principals are interested in risk sharing because monitoring is not feasible.

Communication

Agency theory suggested that the amount of negotiation between the parties would be greater when monitoring was not possible. Institutional theory suggested that the presence of a legitimate tradition would reduce negotiation. We observed no difference in the amount of negotiation across the experimental conditions but, consistent with agency theory, principals conceded more to agents' demands when performance could be monitored.

The amount of task-oriented information exchanged between the parties

was greater when monitoring was possible and no tradition was present. The content of these exchanges revealed that principals who could monitor often advised agents, and the agents sometimes asked for advice. In one exchange, the agent asked, "Do you want me to continue spending $150 until you tell me to stop?" and the principal replied, "Stop spending $150 and try $200 for three rounds." In other exchanges, principals suggested, "Your best amount seems to be around $40," and "You are making a great effort but that $125 was to [sic] much to spend. It did not make us more than the $50 estimate you made. Keep trying." This trend may indicate that monitoring increased the level of cooperation between the parties, as has communication in studies of negotiation (Murnighan, 1977).

Limitations

There are questions about the generalizability of the results of this study to ongoing organizational contexts. In the simulation, we created different roles and incentives consistent with the assumptions of agency theory. Aside from the risk orientations of the subjects, which we did not manipulate, the study produced a context that was consistent with agency theory.[3] The "mundane realism" of our study (Aronson & Carlsmith, 1968) rested on the validity of those assumptions. Also, our study measured agents' effort by how much they spent for information. Arguably, having a dollar measure of effort may have made monitoring easier for principals and therefore more potent. Nonetheless, we would expect our results to generalize to contexts such as sales in which expenses may serve as a dollar proxy for a salesperson's effort.

The completeness of the tradition manipulation may also be questioned. Like Jacobs and Campbell (1961), we relied on simple information about the general use of a practice to produce the tradition effect. This rather minimal operational definition does not strongly capture the normative and socially influential qualities of traditions. A more complete manipulation may have produced stronger main and interactive effects for tradition.

Finally, the potentially low motivation of student subjects presents a possible limitation. However, we observed that subjects stayed for an average two hours of playing time, even though they were free to end the simulation and leave at any time. We also observed that all the subjects eligible for cash awards claimed them several weeks after the conclusion of the study. Additionally, principals responded with a mean of 6.1 and agents with a mean of 5.8 on a 7-point postexperimental measure evaluating their willingness to participate in another experimental session. All these observations suggested high levels of subject motivation and involvement.

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[3] The implication of having principals and agents with equivalent risk orientations in our study was that the agents may have been more willing to accept market risk for low premiums. Therefore, our estimates of the risk premium paid to agents may understate the premium that would be necessary if agents were more risk-averse than principals, as agency theory assumes.

Implications

The results of this study combined with those of Eisenhardt's (1988) research indicate that efficiency and tradition are both critical for understanding control and compensation in organizations. Our interaction results suggest that the presence of traditions may interfere with the careful consideration of economic outcomes the agency theory perspective assumes. They also suggest that traditions may inhibit the spread of contingent pay. The persistence of wage differentials in gender-segregated jobs of comparable worth may be an example of such a tradition effect. Consistent with Kanter's (1987) claims, our results also suggest that performance-contingent pay may increase employees' earnings. The resulting levels of pay need not match hierarchical levels, thus challenging existing status structures.

Finally, the results of this study and of Eisenhardt's work suggest several additional research issues. Using simulations like this one, researchers could examine the impact of market risk on people's willingness to offer or accept contingent pay. They might also examine the effects of adopting outcome-contingent pay on organizational and individual performance. In particular, it would be interesting to investigate whether theoretical matches between compensation and monitoring—such as providing contingent pay when monitoring is not possible and noncontingent pay when monitoring is possible—produce better performance than mismatches. Finally, future research might study communication and negotiation more completely in the principal-agent context.

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RESEARCH NOTES

BUSY STORES AND DEMANDING CUSTOMERS: HOW DO THEY AFFECT THE DISPLAY OF POSITIVE EMOTION?

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This study replicates and extends our prior research on expressed emotions. We propose that the levels of a store's busyness and customer demand influence the emotions service employees express during transactions with customers. The busyness surrounding a transaction and the level of demand the transaction places on an employee are cues that provoke inner feelings and provide information about which emotions the employee can best use to gain control over the transaction. We tested three hypotheses reflecting this conceptual perspective using structured observations of 194 transactions between cashiers and customers in five supermarkets. Findings support the hypotheses that busyness is negatively related to cashiers' displayed positive emotion and that customer demand is positively related to displayed positive emotion. Findings do not support the hypothesis that the positive relationship between demand and positive emotion is weaker in busy stores than in slow stores.

An emerging literature examines the emotions expressed in organizational life. Norms about emotional expressions by role occupants, or "display rules" (Ekman, 1973), are perhaps the most frequently discussed determinants of the feelings organization members express (e.g., Hochschild, 1983; Rafaeli & Sutton, 1987; Van Maanen & Kunda, 1989). Hochschild reported, for example, that flight attendants are expected to be pleasant to passengers but bill collectors are expected to be nasty to debtors. Rafaeli and Sutton (1987) extended Hochschild's work and developed a framework specifying how organizations and occupations select, socialize, and reward employees to help assure that they will display normative emotions.

An emphasis on norms about emotional expression is a useful point of

departure, but it overlooks many of the more ephemeral determinants of displayed emotions (Rafaeli & Sutton, 1989). Norms provide ground rules for transactions between role occupants and target persons, the people with whom they interact. But cues associated with a transaction can further shape the emotions displayed during it, and such cues thus may explain variance between transactions. These "transaction-defining cues" (Rafaeli & Sutton, 1989) may come from either the setting or the target person. Cues from the setting are transient aspects of the context in which a transaction occurs, including the time of day or year, the temperature, and the interpersonal context. For example, crowded settings produce anxiety and antagonism toward others, apparently because people suffer from cognitive overload and have trouble predicting and controlling such settings (Fiske & Taylor, 1984).

Cues from target persons include gender, age, and apparent social status. A role occupant may also recall past transactions with a given target person, notice subtleties of the target person's behavior before a transaction begins, and make additional judgments about the target person as the transaction unfolds. Taken together, these bits of information may invoke a service employee's implicit personality theories (Bruner & Tagiuri, 1954) about which emotions are best displayed to a particular kind of person. Qualitative evidence that such cues shape displayed feelings has appeared in writings on employees of Disneyland (Van Maanen & Kunda, 1989), police officers (Van Maanen, 1978), cocktail waitresses (Spradley & Mann, 1975), and waiters (Mars & Nicod, 1984). Quantitative data are sparse, but Goodsell (1976) found that postal clerks were more courteous to customers who appeared to be of high rather than low status. And Rafaeli (1989a) found that both man and woman clerks were more likely to display positive emotion to male customers.

The present study provides further evidence about the effects of cues from settings and target persons on emotions expressed on the job. We replicated and extended our prior research (Rafaeli, 1989a,b; Sutton & Rafaeli, 1988) by examining store busyness, a cue from the setting, and customer demand, a cue from target persons, as predictors of displayed positive emotion in 194 transactions between cashiers and customers in five Israeli supermarkets. We defined busyness as the extent to which a store was rapidly paced and crowded with customers. Customer demand was the extent to which a transaction required a prolonged and complex response from a cashier. Our prior work suggested that busyness and demand provide information to employees about which expressed emotions are best for gaining control over customers (Sutton & Rafaeli, 1988). Employees try to maintain control, or "get the jump" (Whyte, 1946: 65), during service transactions so they can use work methods that they or their employers believe to be best rather than the methods customers prefer (Rafaeli, 1989b).

Busyness and demand also provoke feelings of stress that verbal and nonverbal behavior may in turn reflect. Human beings can express emotions that clash with their inner feelings and may do so in response to display

rules (Gordon, 1981; Hochschild, 1983). Nonetheless, our prior research suggested that, regardless of display rules, service employees' inner feelings often strongly influenced their expressed emotions. This perspective is consistent with experimental research indicating that there is a strong link between felt and expressed emotions (Ekman, Friesen, & Ancoli, 1980) and that people typically leak their inner feelings when trying to express emotions that are incongruent with those feelings (Ekman, 1985). Furthermore, even when strong display rules are present, most work roles allow employees considerable discretion over their expressed emotions (Van Maanen & Kunda, 1989). Indeed, employees in most work roles are allowed enough leeway to display emotions that are shaped by their inner feelings.

In an earlier study, we used theory about the combined pressures of getting the jump on customers and inner feelings to untangle quantitative findings that clerks in busy convenience stores—those with high sales and long lines—were less likely to display good cheer to customers than clerks in slow stores (Sutton & Rafaeli, 1988). Qualitative data from that study suggested that the display of good cheer during slow times and the absence of such a display during busy times helped clerks retain control over customers. During slow times, loss of control occurred because customers sometimes became irate when a clerk, who apparently had little to do, didn't take a few seconds to be friendly. In contrast, during busy times, expressing positive emotion was risky because it encouraged customers to prolong transactions, which made other customers waiting in line cranky.

These data also suggested that displaying good cheer during slow times and not doing so during busy times reflected clerks' inner feelings. Customers were a welcomed source of entertainment during slow times and thus provoked warm feelings. In contrast, clerks were tense during busy times, apparently due to the cognitive overload evoked by the crowded setting and the stress of serving customers who were irritated from navigating the busy store and from waiting in line.

The inverse relationship between store busyness and expressed positive emotion observed in our earlier study of convenience stores has not, however, been examined with other data. The first aim of the present study was therefore to replicate our earlier findings. Thus,

> *Hypothesis 1: Store busyness will be negatively related to the degree to which cashiers display positive emotion when interacting with customers.*

Customer demand is the second transaction-defining cue we examined. A demanding customer is one who requires a prolonged and complex response from service employees. Such customers are not necessarily rude or unpleasant. Rafaeli's (1989b) fieldwork indicated that cashiers often expressed greater positive emotion to such customers because it helped them gain control over the long and complex transactions. The notion that good cheer is one of the means that service employees use to win the subtle battle for control over demanding customers was first described by Whyte in his

classic research on restaurants (1946). More recent ethnographic studies of waiters (Mars & Nicod, 1984) and milkmen (Bigus, 1972) have also supported this idea.

Thus, qualitative work has suggested that expressed positive emotions are tools of interpersonal influence that can help service employees win struggles for control with their customers. Positive emotions may have this impact because warm people are more likeable than cold people (Asch, 1946; Schneider, Hastorf, & Ellsworth, 1979) and because people are more easily influenced by someone they like rather than dislike (Cialdini, 1984: 163–202). The expression of good cheer may also enhance service employees' control because the behaviors composing displayed positive emotion, like smiling and making eye contact, provoke compliance in others. For example, research has shown that smiling cocktail waitresses earned larger tips than unsmiling waitresses (Tidd & Lockard, 1978). And pedestrians who were gazed at were more likely to accept a pamphlet from a researcher than those not gazed at (Kleinke & Singer, 1979).

Service workers will, we contend, use these tools of social influence less with customers who aren't demanding because there is less risk of losing control over a person who makes a small purchase, asks few questions, and requests no favors. And if control is lost, the episode won't last long. In contrast, a cashier who loses control over a demanding customer may be deluged with more questions and requests, prolonging the loss of control. Thus, given the stronger incentives that exist for maintaining control over demanding transactions, we propose:

> Hypothesis 2: Customer demand will be positively related
> to the display of positive emotion by cashiers during
> transactions with customers.

Finally, store busyness and customer demand may also have interactive effects. The meaning of a demanding transaction to a service employee may vary depending on whether it occurs in a busy or a slow store. During slow times, a long and complex transaction can provide entertainment for a service employee. Thus, when a store is slow, displaying positive emotion as a means of obtaining control is consistent with an employee's inner feelings. When the setting is busy, however, demanding customers may provoke irritation rather than pleasant feelings. Service employees may experience conflict between the desire to use displayed positive emotion as a tool of social influence during each demanding transaction and the irritation provoked within them by trying to rapidly process customers who make large purchases or ask a lot of questions. Feelings of irritation may begin to compete with—or dominate—efforts to display good cheer in order to get the jump.

> Hypothesis 3: The positive relationship between customer
> demand and displayed positive emotion will be stronger
> to the extent the transaction takes place in a slow rather
> than a busy store.

METHODS

Research Setting

Data were collected in a supermarket chain in Jerusalem, Israel, as a sequel to a qualitative and inductive study of cashiers the first author conducted in this chain (Rafaeli, 1989b). Her fieldwork entailed working part-time (18 hours a week) as a cashier for three months in one of the stores included in this study, conducting 30 interviews with cashiers and 30 interviews with customers, and making and recording unstructured observations.

The operation of supermarkets in Israel and in the United States is similar. The stores studied have a large assortment of products, multiple brands, a large physical scale, and a large sales volume. A distinction is that customer service is not as well developed in Israel as it is in other Western countries. Customers and cashiers often argue; and rudeness is common. Corporate guidelines for cashiers do not mention a requirement to smile or act friendly (cf. Rafaeli, 1989b). Nonetheless, Israeli stores provide a useful setting in which to study displayed positive emotion. First, there is some normative pressure for good cheer. Managers told Rafaeli that they expected cashiers to be courteous, and cashiers were aware of such expectations. Second, the findings from Rafaeli's fieldwork led us to assume that cashiers in this chain used good cheer to gain control over demanding customers. The present study enabled us to test a hypothesis derived from that assumption. Third, these stores offer an opportunity to document the inverse relationship between busyness and positive emotion in a setting in which display rules do not support good cheer as strongly as they do in American service organizations. It could be argued that employees in settings with weaker display rules are typically neutral or indifferent to customers, regardless of store pace. But if we observed this negative relationship here, we could make a stronger argument for the generality of that finding.

Data and Procedures

The data were 194 transactions between customers and 22 female cashiers in five stores. Between 2 and 12 transactions were observed for each cashier, with a mean of 9 and a mode of 10. Observation times were evenly dispersed among Mondays, Tuesdays, Thursdays, and Fridays. Store visits were varied systematically so that observations were made during mornings, afternoons, and evenings.

Corporate management consented to this study as part of Rafaeli's (1989b) research on cashiers. The stores' managers and employees agreed to take part in a study that would include unobtrusive observations. They were informed that their identities would be kept confidential and that the data would be used only for research purchases. Making covert observations in a public place is generally viewed as ethical because the subjects are aware that others can observe their behavior (Webb, Campbell, Schwartz, Sechrest,

& Grove, 1981). Observing people in public places becomes ethically questionable when doing so harms or embarrasses subjects or when their anonymity cannot be protected—none of which were risks in this study.

The procedures are based on observational methods developed in prior research (Rafaeli, 1989a; Sutton & Rafaeli, 1938). Two stages were used to refine this method for the current study and to train an observer who would not be biased by the research questions considered in this study. In the first stage, two observers—the first author and another woman—visited stores together. Each independently rated the same transactions on each variable. They then discussed differences in ratings to try to resolve them. In the second stage, the observers independently rated 42 transactions. Spearman correlations between these two sets of ratings ranged from .73 to .88 for ratings of cashier and customer behavior and from .94 to 1.00 for more objective variables, such as the length of the longest line observed.

The trained observer gathered the data reported here in the winter and spring of 1986. Data were recorded on preformatted cards. The observer first acted as if she were shopping for a few minutes. She then moved near the cashier at the extreme right of the store, stood unobtrusively at the corner of the checkout area, and recorded information about cashiers and their customers. She moved to observe the next cashier to the left after 12 customers or 5 minutes, whichever came first, and repeated this cycle for one to three additional cashiers. The observer left the store after 10 or 15 minutes to avoid provoking suspicion.

The observer was not informed of the research questions examined here to avoid biasing the data. She was told that the aim of the study was to replicate an earlier study (Rafaeli, 1989a) of the relationships between displayed emotions and cashier gender, customer gender, and cashiers' wearing a uniform. The other variables assessed were described as necessary for methodological control. When the observer was debriefed and told the true research questions after the data gathering was complete, she said she had not suspected that she had been misled.

Predictor Variables

This study examined two predictor variables: store busyness and customer demand. The scale measuring *store busyness* consisted of three items assessed by the observer: (1) the number of cash registers operating, (2) the number of people in all lines, and (3) the number of people in the longest line. The observer counted all people standing in line, even if they were obviously not customers (e.g., spouses or children). Cronbach's alpha for this index was .92.

The index measuring *customer demand* included four items ($\alpha = .69$): (1) the size of a customer's purchase (small, medium, or large), (2) the degree to which the customer placed task-related demands on the cashier (e.g., asking about prices or for an especially large bag), (3) the degree to which the customer asked the cashier to perform special chores (e.g., asking for small change or for help holding a crying child), and (4) a global judgment of

customer demand—the overall pressure for attention the customer placed on the clerk through the combination of the first three items and other pressures for attention, including talking a lot, telling jokes, and making comments about the cashier's work.

Dependent Variables

Dependent variables were observations of two aspects of displayed positive emotion. The first index, the *mechanics of displayed positive emotion*, is based on our prior studies (Rafaeli, 1989a; Sutton & Rafaeli, 1988). This index was originally composed of four behaviors: greeting, eye contact, smiling, and saying thank you. We deleted the greeting variable from the index used here, however, because this behavior did not occur in 99.5 percent of the cases observed. Thus, three items composed this index ($\alpha = .63$):

(1) Eye contact indicated the number of times a cashier attempted to establish eye contact with a customer during a transaction. It was defined as a direct gaze by the cashier at the customer, regardless of the customer's response. The observer recorded a 0 if no eye contact was attempted (61 percent of the cases), a 1 if there was a single attempt, and a 2 if there were two or more attempts.

(2) Smiling, as Tidd and Lockard [1976] suggested, was defined as a noticeable uptwist of the lips. A 0 was recorded if no smiling was observed (74 percent of the cases), a 1 if there was a single smile, and a 2 if there were two or more smiles.

(3) Thanking indicated whether or not the cashier offered a polite verbal comment indicating a transaction had ended. The observer assigned a rating of 1 if "thank you" ("toda" in Hebrew), any of its derivatives, or any other form of separation comment (e.g., "have a nice weekend" or "happy holidays") was spoken. Thanking was evident in 18.0 percent of the cases.

Although this index has proven useful in earlier quantitative research, our qualitative research (Rafaeli, 1989b; Sutton & Rafaeli, 1988) and review papers (Rafaeli & Sutton, 1987, 1989) suggested that it did not capture many nuances of expressed emotions. In particular, we observed transactions in which service employees mechanically smiled, established eye contact, and said thank you but did not otherwise respond to the fact that customers were human beings. We even observed transactions in which employees displayed these components of good cheer yet were generally insulting throughout the conversation.

Furthermore, these three simple behaviors do not reflect other means through which a cashier can promote a friendly two-way interaction with customers. To illustrate, one cashier told Rafaeli that she sometimes sang to customers as a way of being friendly (Rafaeli, 1989b). Customers also told Rafaeli that they hoped for a cashier who attended to their needs rather than a cashier who performed predetermined acts. Finally, Rafaeli's qualitative work in these stores indicated that some cashiers did not engage in any human contact with their customers and concentrated only on processing

groceries. Focusing no attention on a customer indicates a lack of displayed positive affect that goes beyond simple absence of eye contact, smiling, and thanking.

These examples suggest that the extent to which a service employee attempts to promote—or discourage—friendly interaction with a customer may be somewhat independent of the extent to which he or she offers smiles, eye contact, and thanks. As a result, we developed an index that reflects a cashier's *interactive display of positive emotion* during a transaction with a customer. This index has two items ($\alpha = .81$):

(1) Pleasantness was the degree to which a cashier manifested a generally positive attitude, or the extent to which her behavior toward a customer encouraged friendly interaction. This item was measured with a three-point scale on which 0 indicated the cashier acted generally unpleasant during a transaction (i.e., was consistently impatient, crabby, or annoyed), 1 indicated that the cashier was somewhat pleasant, and 2 indicated that the cashier was very pleasant. The observer rated cashiers as unpleasant in 56 percent of the transactions.

(2) Attending indicated whether or not a cashier ignored a customer. A value of 0 was assigned if the cashier processed the items but ignored the customer (e.g., by punching prices and codes without communicating with the customer). A value of 1 was assigned if the cashier attended to the customer, which occurred in 58 percent of transactions.

We conducted a factor analysis consisting of principal components analysis with a varimax rotation to help determine if these two sets of items measured distinct aspects of displayed positive emotion. Table 1 presents the results of this factor analysis, which indicates the presence of two distinct factors, the mechanics of displayed positive emotion and the interactive display of positive emotion.

Control Variables

The aim of this study was to document the effects of store busyness and customer demand and their interaction on the two indicators of displayed

TABLE 1
Factor Analysis of Items Measuring Expressed Positive Emotion[a]

	Factor Loadings	
Factors and Items	Factor 1	Factor 2
Mechanics of displayed positive emotion		
Eye contact	.77	.13
Smiling	.74	.30
Thanking	.68	.12
Interactive display of positive emotion		
Pleasantness	.31	.86
Attending	.11	.91

[a] $N = 194$.

positive emotion, above and beyond the effects of other factors. Thus, we identified and measured eight variables that could influence these relationships. The following eight variables were based on data gathered by the observer: (1) Time of day, indicating the hour that an observation was made, was coded on a 24-hour clock. We controlled for time of day because different types of customers may shop at different times, stores may be more crowded at some times than at others, and different cashier shifts may have different display rules. (2) We controlled for customer gender (coded 0 for men and 1 for women, who were 69 percent of the customers) because prior research has suggested that male customers encounter positive emotion more often than female customers (Rafaeli, 1989a). (3) Customer status was based on assessments of customers' styles of dress, accessories, haircuts, and (for women) makeup. These overall judgments of the customers' apparent social status were coded 1 for low, 2 for medium, and 3 for high. We controlled for status because service employees may be more courteous to high-status customers than to low-status ones (Goodsell, 1976). (4) The observer estimated customer age, with 30 years or less coded 1, 30 to 50 years coded 2, and over 50 years coded 3. (5) Cashier uniform was a rating of whether a cashier was wearing a smock and a name tag. No smock and no tag was coded 0, only a smock or only a name tag was coded 1, and wearing both a smock and name tag was coded 2. We controlled for this variable because Rafaeli's (1989a) research suggested that clerks who followed corporate norms about wearing a uniform were more likely to display good cheer. (6) A cashier's talking to other people indicated whether the cashier talked to any person other than the customer during the transaction. Talking to no other person was coded 0, talking to one other person was coded 1, and talking to two others was coded 2. No transaction was observed in which conversations with more than two others occurred. When talking to others, a cashier's displayed emotions may reflect reactions to the other person rather to the customer served. (7) The presence of another cashier indicated if there were other cashiers working next to the observed cashier. The code was 0 if the cash register on neither side of the observed was in use, 1 if one of the registers was in use, and 2 if both were in use. We controlled for this variable because cashiers may hold and try to enforce a distinct set of norms about the emotions one another display. These informal expectations are likely to be especially influential when cashiers work in close proximity. (8) Store identifiers, four dummy-coded variables representing the five stores, controlled for differences between stores such as management practices, norms about courtesy, busyness, and customer demand.

RESULTS

Table 2 presents the means, standard deviations, and intercorrelations among all the variables examined in this study, except for the interaction term, store busyness by customer demand, and the dummy-coded store identifiers.

TABLE 2
Means, Standard Deviations, and Intercorrelations Among Study Variables[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10
1. Mechanics of displayed positive emotion	0.34	0.46										
2. Interactive display of positive emotion	0.60	0.59	.49									
3. Store busyness	13.58	9.39	-.11	-.06								
4. Customer demand	0.68	0.46	.47	.43	-.02							
5. Time of day	11.85	3.17	-.01	-.07	.08	.11						
6. Customer gender	0.69	0.46	-.10	-.05	-.02	.10	-.09					
7. Customer status	2.06	0.77	.02	-.09	.16	.16	.01	.12				
8. Customer age	2.08	0.72	.04	.09	-.04	.13	-.14	.08	.06			
9. Cashier's uniform	1.07	0.67	-.15	.26	.13	.05	-.05	.02	.15	-.02		
10. Cashier's talking to others	0.56	0.96	.08	.04	-.03	.12	-.06	.07	.09	.03	-.11	
11. Presence of another cashier	0.93	0.59	.05	.16	.20	.09	.06	.03	.07	.07	.22	.09

[a] $N = 194$. All correlations above $r = .14$ are significant at $p < .05$, two-tailed test.

TABLE 3
Predictors of Displayed Positive Emotion[a]

Variables	Mechanics of Displayed Positive Emotion	Interactive Display of Positive Emotion
Time of day	.20**	.03
Customer gender	−.17**	.12*
Customer status	−.07	−.00
Customer age	−.05	.03
Cashier's uniform	.21**	.29**
Cashier's talking to others	.09†	.02
Presence of another cashier	−.06	.07
Store 1	−.35**	−.05
Store 2	−.03	.09
Store 3	−.16*	−.11†
Store 4	−.22**	−.03
Store busyness	−.27***	−.19**
Customer demand	.37***	.41***
Multiple R	.51	.54
Adjusted R^2	.21***	.24***

[a] $N = 194$.
  † $p < .10$, two-tailed test
  * $p < .05$, two-tailed test
  ** $p < .01$, two-tailed test
  *** $p < .001$, two-tailed test

The hypotheses were tested with a hierarchical multiple regression procedure. First, we entered the eight control variables as predictors in two equations, one for each dependent variable. The control variables were marginally related to the mechanics of displayed positive emotion (adjusted R^2 = .03, $p < .10$) and significantly related to the interactive display of positive emotion (adjusted R^2 = .06, $p < .05$). The results indicate that cashiers who wore uniforms were more likely to display both aspects of positive emotion. Moreover, customer gender, a cashier's talking to others, and the store in which an observation took place predicted the mechanics of displayed positive emotion.

Next, a pair of regression equations was used to test Hypotheses 1 and 2, with the eight control variables, store busyness, and customer demand used as predictors of both measures of displayed positive emotion. As Table 3 indicates, store busyness was negatively related to both the mechanics of displayed positive emotion and the interactive display of positive emotion, as Hypothesis 1 predicts. Table 3 also indicates that we found positive relationships between customer demand and both the mechanics of displayed positive emotion and the interactive display of positive emotion, providing strong support for Hypothesis 2. The statistically significant beta weights for store busyness and customer demand indicate that the increment in R^2 that occurred between these equations and those including only the control variables was significant (Cohen & Cohen, 1975).

Hypothesis 3, predicting a weaker positive relationship between customer demand and displayed positive emotion in busy stores than in slow stores, was tested with moderated regression analysis. For each of the two dependent variables, we entered the interaction term, customer demand by store busyness, into an equation along with the ten predictor variables shown in Table 3 (the eight control variables, customer demand, and store busyness). Findings did not support Hypothesis 3. The beta weight of the interaction term was not statistically significant in the equation predicting the mechanics of displayed positive emotion ($\beta = -.05$, n.s.) or in the equation predicting the interactive display of positive emotion ($\beta = -.19$, n.s.). The overall equations for both mechanics (adjusted $R^2 = .21$, $p < .001$) and interactive display (adjusted $R^2 = .24$, $p < .001$) remained significant.

This moderated analysis generally supported the first two hypotheses. As with the equations presented in Table 3, store busyness was negatively related to mechanics of displayed positive emotion ($\beta = -.23$, $p < .05$) and customer demand was positively related to both mechanics ($\beta = .41$, $p < .001$) and the interactive display of positive emotion ($\beta = .53$, $p < .001$). But in contrast to the equations presented in Table 3, the relationship between store busyness and the interactive display of positive emotion was no longer significant ($\beta = -.05$, n.s.), apparently because of multicollinearity between the interaction term and store busyness. Taken together, the results of the hierarchical regression procedure support Hypotheses 1 and 2 but not Hypothesis 3. These findings suggest that the regression equations portrayed in Table 3 best summarize the data collected in this study.

DISCUSSION

This study provides additional evidence that service employees are less likely to display good cheer during busy times than during slow times. Findings also confirm that cashiers display more positive emotion when customers are demanding. We found no support, however, for our prediction that the positive relationship between customer demand and good cheer is weaker when a transaction takes place in a busy store.

This study suggests useful directions for future research. First, we now have evidence from two quantitative studies that employees in busy stores are less likely to convey positive emotion to customers than are employees in slow stores. Additional research is needed to discover if this pattern is evident in other settings. Second, our assertion that expressed positive emotion helps service employees maintain control over demanding customers is a plausible explanation for the findings pertinent to Hypothesis 2. Further research is needed to test this assertion directly and to uncover the virtues and hazards of expressed positive emotions as tools of interpersonal influence. For example, is acting pleasant still the best way for a service employee to get the jump when a customer is not just demanding, but openly hostile to the employee? An irate customer may view good cheer as evidence of

sarcasm and grow further aggravated. Perhaps adopting a neutral, rather than a positive or negative, demeanor is a better way to get the jump over irate customers.

Third and finally, we begin this article by suggesting that research on expressed emotion in organizations has begun to shift its emphasis from explaining similarities in expressed emotions within roles to explaining differences. But the present study suggests that research on similarities in the emotions expressed by members of the same occupation continues to be a promising path. Much consistency was evident in the ground rules used by the cashiers we studied: they were typically unpleasant. Cashiers offered no greetings in 99.5 percent of the transactions observed, established no eye contact in 61 percent, did not smile during 74 percent, expressed no thanks in 82 percent, were judged to be unpleasant in 56 percent, and did not attend to customers in 42 percent. The data presented here suggest that there is much similarity in the emotions expressed within work roles, similarities that will not be noticed if researchers focus only on explaining variance in such behavior.

The consistent lack of positive emotion observed here does not, for the most part, seem due to organizational or occupational display rules. Instead, these findings suggest to us that societal display rules explain most of this lack of good cheer. Comparing our experiences in service organizations in Israel to experiences in the United States suggests that societal display rules provide much stronger support for expressed positive emotion in the latter. Unfortunately, poor service is typical in Israeli stores. This difference was made explicit in the following transaction that Rafaeli observed during her participant observation in Israel:

> Customer: "In America, all the cashiers smile."
> Cashier: "So go to America. What do you want from me?" (1989: 263)

We are not aware of any systematic research that has attempted to untangle the effects of cultural and organizational display rules on the emotions organization members display. Yet this anecdote—along with the quantitative data from the present research—strongly hints that carrying out cross-cultural research on members of service organizations may explain both similarities and differences in displayed emotions.

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ERRATA

In the table of contents for the June 1990 issue, David A. Waldman's
name was inadvertently left off his coauthored article. The correct
entry should have read:

   Age and Work Performance in Nonmanagerial Jobs:
   The Effects of Experience and Occupational Type
      Bruce J. Avolio, David A. Waldman, and
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We apologize for this omission and any inconvenience it may have
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CONTENTS
Volume 33, Number 4, December 1990

FROM THE EDITOR

Editorial statements and doctoral dissertations have something in common. They take considerable time and thought to prepare, are not widely read as a rule, and have limited utility beyond the immediate context in which they are offered. Of course, these considerations didn't stop any of us from completing our dissertations, nor will they deter me from preparing my final editorial statement.

The December issue signals the end of my term as editor. It's an occasion marked both by excitement and a certain degree of sadness. The excitement is due to a long-awaited return to full-time teaching and research after a prolonged period of editorial and administrative assignments. My sadness comes from the fact that I will have less frequent contact with the many dedicated and talented people I have been so fortunate to work with these past few years.

By tradition, my final editorial would have three parts. First, I have some statistics on the performance of the *Journal* this past year to share with our readers. Second, there are a number of people who should be recognized for having made important contributions to the *Journal*. Finally, the last editorial offers an opportunity to reflect on some of the things I have learned as a consequence of my ten-year association with the *Journal*.

I feel an obligation to Academy members to report performance statistics and a personal need to express appreciation to a number of individuals who have made my job easier and more enjoyable. I do both below. At the risk of breaking with tradition, however, I have decided to forgo the opportunity to share whatever I may have learned about reviewing and the role of journal publication in the research process. My predecessor, Janice Beyer, offered readers a very insightful analysis of the review process in her December 1987 editorial. Moreover, a comprehensive treatment of the publication process is available in Frost and Cummings' *Publishing in the Organizational Sciences* (1985). Whatever I might say at this point has been said far more eloquently before.

Instead, I have decided to use my final editorial to call attention to a recent activity within the Academy that has important implications for publishing research and our broader professional association.

Professional Ethics

The Task Force on Ethics recently completed the Academy's first Code of Ethical Conduct. I am pleased to report that the code was unanimously approved by the Board of Governors and overwhelmingly ratified by the members responding to the request for its approval. The Code of Ethical Conduct represents an important document, one that I hope each and every Academy member will read closely.

The *Journal* editorship lies near the intersection of some of the most important transactions that take place among members of the Academy. It is

exactly at such transactional boundaries, where members interact with each other and with outside groups, that ethical questions loom largest. During my term as editor, I have had a number of instances of questionable behavior called to my attention and have witnessed at least one clear case of concurrent submission. Each incident took considerable time away from more important *Journal* responsibilities and was a source of personal frustration. It would be easy to succumb to cynicism as a consequence of these incidents. One might conclude, for instance, that some Academy members are less interested in contributing to the knowledge base of our field than in advancing their own careers by cutting corners in the publication process.

I sincerely believe this would be an inappropriate conclusion. Incidents of unethical behavior remain reassuringly rare. Moreover, in the vast majority of cases, I am convinced that the ethically questionable behaviors called to my attention were less likely instances of unscrupulous behavior than examples of simple ignorance of the professional norms governing our behavior. This is true both for new people entering the field and for several more established scholars who seem not to have been properly socialized.

On the basis of various talks I have given to doctoral consortia and other groups around the country, I have come to realize there is not a clear understanding or consensus about the norms that should govern the conduct of research or reports of its results. This makes the Code of Ethical Conduct even more important in my mind. The code clearly sets forth guidelines relevant to the research and publication process. Moreover, it makes clear that ethical responsibilities extend to all aspects of our professional role, including teaching, consulting, and reviewing.

The development of a code of ethics represents an important milestone in the evolution of the Academy of Management. However, it will be a hollow monument unless we embrace its intent and work hard to put its prescriptions into practice. The code is also a living document. I believe it will prompt a healthy dialogue among Academy members concerning professional norms. As a result of these discussions, the code will evolve and be strengthened over time. Those who seriously consider the implications of the code for their own conduct as professionals will be enriched by the process. The entire Academy will be enriched by an open discussion of what it means to behave ethically as management professionals.

I commend the Task Force on Ethics and recommend that the outcome of their efforts be carefully read by all Academy members. The Code of Ethical Conduct is printed at the back of this issue. Individuals wishing reprints of the code for use in their classes can obtain them from the *Journal* office at Texas A&M University.

Performance Statistics

As documented in Table 1, 431 new submissions were received from July 16, 1989 to July 15, 1990. The table indicates that no manuscripts were

TABLE 1
Initial Decisions on Manuscripts Received from July 16, 1989 to July 15, 1990

Decision	Number	Percent
Returned without review	48	11.1%
Withdrawn from review	3	0.7%
Currently under review	43	10.0%
Rejected after review	265	61.5%
Invited to revise	72	16.7%
Accepted for publication	0	0.0%
Total submissions	431	100.0%

accepted for publication after the initial review. All manuscripts that are ultimately accepted for publication undergo at least one and usually several revisions.

Table 2 provides data on the decisions made on revisions during the same period. A total of 45 revisions were accepted for publication, although not all had been initially submitted during the reporting period. The numbers clearly indicate that the probability of acceptance goes up with an invitation to revise. The number of authors who do not promptly respond to an invitation to revise their papers suggests this fact may not be widely known or appreciated.

Finally, Table 3 provides information on the time required to make decisions on papers submitted to the *Journal*. The numbers suggest that *AMJ* continues to provide authors with some of the most timely feedback in the publication business. We strive very hard to provide our contributors with fast decisions and comprehensive feedback. Although we don't achieve our high standards in each and every instance, the average number of days required to reach a decision is testimony to the dedication of our editorial review board members and ad hoc reviewers.

A Note of Appreciation

One learns many things as a consequence of being a journal editor. Perhaps the most profound lesson concerns just how much a journal de-

TABLE 2
Decisions on Revisions Received from July 16, 1989 to July 15, 1990

	Status			
Decision	First Revision	Second Revision	Third Revision	Total
Under review	19 (21%)	3 (9%)	0	22
Rejected	25 (27%)	4 (12%)	0	29 /
Invited to revise	29 (31%)	7 (21%)	0	36
Accepted	19 (21%)	19 (58%)	7 (100%)	45
Totals	92 (100%)	33 (100%)	7 (100%)	132

TABLE 3
Review Time on Manuscripts Processed from July 16, 1989 to July 15, 1990

	Days in Review	
Decision	Median	Mean
Returned without review	—	—
Rejected after review	45	≤1.3
Invited to revise	52	51.6
Accepted for publication	33	27.0

pends on the willingness of so many people to give freely of their time and expertise. Without the assistance of many dedicated and committed colleagues, publication of this journal would be impossible.

During my term as editor, I have been truly fortunate to have an outstanding editorial review board and three excellent consulting editors. Reviewing manuscripts is a time consuming process and each individual listed on the masthead of the *Journal* has made an important contribution to our profession. I'd like to express special appreciation to the three consulting editors who have served the *Journal* the past three years. John Fossum, Michael Hitt, and Claudia Schoonhoven have performed above and beyond the call of duty in reviewing papers and in working with authors to get their manuscripts into publishable shape. Working closely with these three dedicated individuals and the members of the editorial board has been one of the important rewards of my editorship.

In addition to members of the editorial review board, the *Journal* calls on a number of people to serve as external reviewers each year. These individuals are recognized for their important contributions elsewhere in this issue.

Less tangible but no less important to the smooth functioning of the *Journal* is the support I've received from a number of groups and individuals for my editorship. The Board of Governors and officers of the Academy have been a constant source of support and encouragement. Dave Whetten, my colleague at *AMR*, and I assumed our editorships at the same time. Working closely with Dave has been both a pleasure and a tremendous learning experience. James E. Reinmuth, Dean of the College of Business at the University of Oregon, provided important financial suppport for the *Journal* and release time for my work as editor. Jim often asks when he'll get me back as a full-time faculty member. Yes, Jim, I'm almost done.

The publication of the *Journal* would also be impossible without the considerable efforts of our staff members. Steve Gomes, production editor, Persephone Doliner, copy editor, and Nancy Dodd, index editor, make important contributions behind the scenes. Their work makes an important difference in publishing a high quality journal. It has been a pleasure being associated with each of them.

Finally, there is one individual who deserves far more accolades than

I'm able to communicate here. Dorothy Wynkoop, the *Journal* secretary, is the glue that binds the entire enterprise together. Contributors and reviewers who have interacted with Dorothy know how conscientious and professional she is. From personal experience, I know how effectively she handles distracted, over-worked, and occasionally grumpy editors. Over the years, Dorothy has worked tirelessly for an Academy president, a national and two division program chairs, and a *Journal* editor. The Academy of Management owes her an important debt of gratitude. On behalf of the Academy, I extend to Dorothy our heartfelt thanks.

Looking to the Future

Readers will notice several important changes with publication of the next issue of the *Journal* in March. First, the *Journal* will have a new cover that coordinates its design with *AMR* and *AME*. In addition to improving the looks of the *Journal*, the three Academy publications will now have a corporate identity that ties them together.

Second, in cooperation with Dave Whetten and with the hard work of Lee Meiser, *AMJ* and *AMR* will now share a common style guide. Authors preparing papers for either journal will have only one style guide to contend. with, a fact that we hope makes your job a bit easier.

Finally, the *AMJ* will have a new editor. With Mike Hitt taking over, the *Journal* will be in very capable hands. I wish for Mike all the cooperation and dedication I received during my term. Good luck, Mike.

RTM

PAST EDITORS

Paul M. Dauten, Jr., *University of Illinois*   1958–60

Dalton E. McFarland, *Michigan State University*   1961–63

Paul J. Gordon, *Indiana University*   1964–66

Stanley C. Vance, *University of Oregon*   1967–69

William G. Scott, *University of Washington*   1970–72

John B. Miner, *Georgia State University*   1973–75

Larry L. Cummings, *University of Wisconsin-Madison*   1976–78

John W. Slocum, Jr., *Southern Methodist University*   1979–81

Thomas A. Mahoney, *Vanderbilt University*   1982–84

Janice M. Beyer, *New York University*   1985–87

ORGANIZATIONAL DIFFERENCES IN MANAGERIAL COMPENSATION AND FINANCIAL PERFORMANCE

BARRY GERHART
GEORGE T. MILKOVICH
Cornell University

This study had two general focuses. First, after reviewing the literature on compensation strategy, we examined the extent to which organizations facing similar conditions make different managerial compensation decisions regarding base pay, bonus pay, and eligibility for long-term incentives. Second, working from expectancy and agency theory perspectives, we explored the consequences of those decisions for organizational performance. Using longitudinal data on about 14,000 top- and middle-level managers and 200 organizations, we found significant differences between organizations. Our results suggest that organizations tend to make different decisions about pay contingency, or variability, rather than about base pay. Findings indicate that contingent pay was associated with financial performance but base pay was not.

A fundamental assumption of much of the literature on compensation is that organizations have considerable discretion in the design of pay policies and that the choices made have consequences for organizational performance (Foulkes, 1980; Gomez-Mejia & Welbourne, 1988; Lawler, 1981; Milkovich, 1988; Milkovich & Newman, 1987). Organizations that are similar in terms of types of employees and jobs, product market, size, and so on may choose compensation system designs that differ in their effectiveness for attaining similar goals. Little is known, however, about the extent, nature, determinants, and performance implications of differences in compensation system designs (Ehrenberg & Milkovich, 1987).

Our study provides evidence on those issues by examining both the determinants and consequences of organizational differences in pay level and pay mix among a nationwide group of top- and middle-level managers. We measured pay mix, or the extent of variable pay, in terms of the relative amounts of short-term bonuses, long-term incentives, and base salary in an individuals' pay. Taken together, these three components determine the level of cash compensation.

DETERMINANTS OF COMPENSATION

Employee and Job Characteristics

Our focus was on identifying and explaining organizational effects on compensation. It was, however, first necessary to incorporate in our model the compensation determinants that previous research has most strongly emphasized—employee and job characteristics—to assure that any organizational effects found would not actually reflect differences in types of employees and jobs.

Human capital theory (Becker, 1975) identifies several employee attributes associated with lifetime earnings. Some of the most important of those attributes reflect investments in training, such as formal education and on-the-job training. Consistent with the theory, there is empirical evidence that the number of years of education and labor market experience individuals have explains much of the variance in their pay levels (e.g., Mincer, 1974). The theory also specifies that cognitive ability, a strong predictor of job performance (e.g., Hunter & Hunter, 1984), increases pay because the more capable acquire training at less cost.

Despite the importance of personal characteristics, organizations also devote much effort to attaching pay rates to jobs, as evidenced by the focus on jobs in the administrative literature (Belcher & Atchinson, 1987; Livernash, 1957; Milkovich & Newman, 1987; Schwab, 1980) and in theoretical models of job competition (Thurow, 1975) and internal labor markets (Doeringer & Piore, 1971; Williamson, Wachter, & Harris, 1975). In a previous study of a large number of exempt employees (Gerhart & Milkovich, 1989), for example, we found that the R^2 for base pay increased from .30 to .80 when we added job level as a variable.

Although much less theory on the determinants of pay mix is available, we suggest that the higher in an organizational hierarchy a job is the greater potential impact on organizational performance its incumbent is likely to have. In expectancy theory terms, there is also more likely to be a perceived link between the employee's effort and organizational performance. This stronger link may offer organizations more opportunity to use bonuses and long-term incentives among high-level managers than among other employees. Agency theory would also predict greater use of contingent compensation at high levels where jobs are less programmable, or where it is more difficult to specify desired behaviors.

Hierarchical level is likely to be an important but imperfect indicator of both impact and programmability. For example, a research scientist may have few, if any, people directly reporting to him or her from lower hierarchical levels. However, such work is often low in programmability and high in potential consequences for organizational performance. In this example and others, a key factor is the amount of training investment in an employee. High human capital investments in the form of education and experience are likely to be associated with low programmability and high potential impact on performance and therefore positively associated with the use of contingent pay.

On the basis of the preceding discussion, we propose that

Hypothesis 1a: *Level of base pay is positively related to an employee's human capital investment and level of job responsibility.*

Hypothesis 1b: *Pay mix is positively related to an employee's human capital investment and level of job responsibility.*

Organizational Variables

After organizational differences in employee and job characteristics are accounted for, do organizations differ in pay level and pay mix? According to such standard economic theories of competitive markets as human capital theory (Becker, 1975) and compensating wage differentials theory (Smith, 1937), the answer is no, at least with respect to pay level. Employers are seen as price-takers who must pay the going rate if they are to be competitive. If they pay less, they will not be able to attract enough qualified employees. If they pay more, their higher costs will drive them out of business. Competitive forces dictate that any deviations from a going rate must be transitory. From this theoretical perspective, there is little room for employer differences in compensation policies.

Case studies by "post-institutional" (Segal, 1986: 383) economists during the 1940s and 1950s, however, suggested that there was no single going rate of pay across organizations for most occupations and that employee and job differences could not entirely explain organizational differences (Dunlop, 1957; Lester, 1946; Reynolds, 1946). For example, Dunlop reported substantial pay differentials across employers for a single job (truck driving) in a single geographic area (Boston). Explanations for such organizational differences have typically centered on historical precedent and ability to pay (Segal, 1986). For example, an employer who expands during a tight labor market might choose to raise pay levels to attract enough good employees. Later, high pay levels may no longer be necessary for attraction and retention but may have become accepted as the organizational norm. The employer might therefore choose not to attempt to change the organization's relative pay level—its position in Dunlop's "wage contour" (1957: 107)—especially if its ability to pay is high. The important implication of the post-institutionalists' work is that market forces do not completely eliminate employer discretion in setting pay level policies.

More recent examinations of organizational differences in pay levels have sought to improve on the early case studies by more systematically estimating the relative influences of organization, job, and employee on pay. Somewhat conflicting findings have emerged. For example, Leonard, using findings from a single group of businesses (California electronics firms), concluded that "firms that deviate from the average (market) wage, tend to return towards the market wage" (1988: 28). His view that organizational differences in pay levels are transitory and random is consistent with classical economic theory and inconsistent with the idea of sustained differ-

ences in organizations' pay strategies. In contrast, Groshen (1988) found that organizational differences in pay level were both important and highly stable over time, suggesting differences in pay level strategies existed across firms.

Leonard's and Groshen's studies, however, have limitations. First and perhaps most important, neither examined pay mix. Although market forces compel a degree of uniformity in pay levels, it is not clear that market forces have an analogous effect on pay mix, and organizations may have considerable discretion in setting pay mix policies and strategies. As we will discuss later, expectancy theory and agency theory clearly predict that some pay mix policies will be more effective than others.

Second, neither study cited controlled for employee characteristics, leaving open the possibility that pay level differences between organizations were a result of different levels of human capital investment. Third, both studies focused largely on lower-level occupations, mostly blue-collar and nonsupervisory white-collar jobs.

Despite these limitations, the two studies suggested that there may be important pay level differences between organizations. Such organizational effects may arise, for example, because of differences in industry, size, financial performance, or strategy. However, before we considered those explanations in more depth, we thought it useful to test first for net organizational effects on base pay. Following previous theory and research, we hypothesized that

> *Hypothesis 2a: Organizations exhibit differences in levels of base pay with employees' personal and job characteristics controlled.*

Although there does not appear to have been any comprehensive theoretical or empirical research regarding differences in pay mix across organizations, evidence from various sources suggests such differences may be substantial. For example, surveys have shown that the use of profit sharing, lump sum bonuses, gain sharing, and other practices related to pay mix vary across organizations, industries, and occupations (Conference Board, 1989; O'Dell, 1987). Although organizational conditions matter, researchers have usually argued that managers have discretion in designing their pay mix (Lawler, 1981; Milkovich & Newman, 1987). As with pay level, we wished to test first for organizational effects on pay mix before considering possible explanations in more depth.

> *Hypothesis 2b: Organizations exhibit differences in pay mix with employees' personal and job characteristics controlled.*

If organizational differences in pay level and pay mix remain after the effects of employee and job factors have been removed, the implication is that theories focusing only on employee and job attributes are insufficient. Our next step was to examine how well the general organizational effect could be explained by specific organizational factors such as industry, size, and financial performance, important factors identified in previous research in economics and in contingency theory.

Industry. Economic research by Krueger and Summers (1986, 1988) demonstrated significant industry effects on pay level that were stable over time. In line with Dunlop's (1957) research, Mahoney has explained such effects as a consequence of the fact that organizations in a particular industry "encounter similar constraints of technology, raw materials, product demand, and pricing" (1979: 122) that provide a constraint on ability to pay.

As for pay mix, in industries with a high variation in product demand and a high ratio of labor costs to revenues, a high percentage of variable pay may be likely. Also, industry may act as a proxy for other organizational characteristics, like union power and the extent of a research and development focus, that are potentially related to pay mix.

Organizational size. Sales volume and number of employees have been positively related to pay level (Mellow, 1982). One explanation is that large firms have both a higher ability to pay and a greater need for high-quality employees than small firms. According to "efficiency wage" theories (Shapiro & Stiglitz, 1984), for example, worker shirking is more of a problem in large firms because it is more difficult to monitor each worker's performance. Thus, large firms may use high pay levels to permit stringent hiring standards. One hypothesis is that a high pay level reduces shirking because employees realize they would be unlikely to find another job that pays as well (Shapiro & Stiglitz, 1984). Brown and Medoff (1989) found that the higher quality of labor in large firms did help explain why the firms paid more (cf. Evans & Leighton, 1989), but their findings did not support the monitoring explanation. Thus, the question of why large firms hire better-quality employees remains to be answered.

Fixed costs of any kind introduce financial risk (Brealey & Myers, 1981). For small firms, which tend to have fewer slack resources than large ones, fixed costs are of special concern. Small firms may therefore pay lower base salaries than large firms. In addition, if growth is a major objective of a small firm, capital investments are likely to be a top priority, one that places heavy demands on cash flow in the near term, again limiting base salary. However, such firms may use long-term incentives with substantial potential payoffs if growth is achieved (Ellig, 1981).

Financial performance. Research has found that firms with high accounting profits (Deckop, 1988), sales growth (Baker, Jensen, & Murphy, 1988), and shareholder wealth growth (Baker et al., 1988; Murphy, 1985) pay their chief executive officers (CEOs) more. But the magnitude of such relations has sometimes seemed small. Baker and colleagues reported that a $1,000 change in shareholder wealth corresponded to a $0.02 change in CEO salary plus bonus. Kerr and Bettis (1987) found no relation between organizational performance and CEO pay. Bonuses would be expected to account for much of the relation between performance and pay. Thus, increases in financial performance should be associated with higher ratios of bonus to base pay. In addition, Jensen and Murphy (1990) estimated that a $1,000 increase in shareholder wealth is associated with a $2.50 increase in the value of the stock owned by the CEO. This again suggests a relation between organizational performance and pay mix.

> Hypothesis 3a: Organizationa! effects; on base pay are re-
> lated to differences in industry, size, and financial per-
> formance.

> Hypothesis 3b: Organizational effects on pay mix are re-
> lated to differences in industry, size, and financial per-
> formance.

Strategy

If compensation differences between organizations remain after differ-
ences in employees, jobs, industry, size, and financial performance are ac-
counted for, the implication would be that even similar organizations may
engage in different compensation practices. Are these different practices
largely a result of chance or do they indicate differences in compensation
strategies?

Pearce and Robinson (1982) described strategic decisions as those that
require top management involvement, entail allocation of large amounts of
company resources, have major consequences for multiple businesses or
functions, are future-oriented, require consideration of external environ-
ment factors, and affect the long-term performance of an organization. Be-
cause compensation typically accounts for 20 to 50 percent of total operating
expenses (Milkovich & Newman, 1987) and has implications for attraction,
retention, and performance motivation across business units and functional
areas, and thus perhaps for organizational performance, certain compensa-
tion decisions are likely to have strategic properties.

The literature on compensation strategy suggests that decisions regard-
ing pay level and pay mix are strategic because they meet many of Pearce and
Robinson's criteria. In contrast, other compensation decisions are less likely
to be strategic. For example, decisions concerning relatively narrow tactical
questions, such as the choice of a job evaluation system or performance
appraisal instrument, are less likely to be strategic (Gomez-Mejia & Wel-
bourne, 1988; Milkovich, 1988).

In measuring strategy, both intentions and actions are relevant, but the
correspondence between the two is not necessarily high (Mintzberg, 1978,
1987; Snow & Hambrick, 1980). Actions, not intentions or plans, are likely to
have the greater consequences for the costs and behaviors related to com-
pensation. Thus, following approaches to measuring strategy that focus on
the outcomes of the strategy process (e.g., Chrisman, Hofer, & Boulton, 1988;
Hofer & Schendel, 1978), we focused on "realized" pay strategies, those in
which "a sequence of decisions in some area exhibits consistency over time"
(Mintzberg, 1978: 935; cf. Miles & Snow, 1978). In other words, for organi-
zational effects to have strategic properties, they should be stable over time.

As was discussed, a common theme in the compensation literature is
that organizations have considerable discretion in designing pay policies
(Foulkes, 1980; Gomez-Mejia & Welbourne, 1988; Lawler, 1981; Milkovich,
1988). With longitudinal data, it is possible to test whether differences in

compensation practices are transitory chance deviations or stable organizational differences. Under Mintzberg's definition, such stability would be consistent with organizational differences in compensation strategies.

> *Hypothesis 4a: Organizational differences in base pay not explained by personal and job characteristics are stable over time, suggesting that organizations have different base-pay-level strategies.*

> *Hypothesis 4b: Organizational differences in pay mix not explained by personal and job characteristics are stable over time, suggesting that organizations have different pay mix strategies.*

An important question that previous research has overlooked is the relative magnitude of organizational effects on pay level and pay mix. Baker and colleagues argued that "widely accepted compensation surveys are ultimately self-perpetuating [and] inherently counterproductive" because the reporting of only pay levels tends to "encourage . . . compensation schemes that are independent of performance" (1988: 610). If that is so, base pay levels should be more consistent across organizations than other aspects of compensation such as bonuses and long-term incentives.

Another reason to expect larger organizational differences in pay mix than in pay level practices is that large changes in pay mix need not affect costs. In contrast, although increases in pay level may have positive consequences, their most immediate and visible consequence is an increase in costs. Organizations may therefore feel more pressure to conform to their competitors in pay level practices than in pay mix practices.

A recent survey of so-called leading edge firms (Hewitt Associates, 1989) found greater consistency in articulated policies concerning pay level than in those on pay mix. In the popular literature on business strategy (Kanter, 1989; Peters, 1987), many recommendations on compensation have focused on making pay variable and contingent on performance. The implication is that pay mix is "where the action is" in differentiating organizations.

In summary, we expected larger organizational effects on pay mix than on pay level. In addition, size, industry, and financial performance seemed likely to explain less of the organizational effect on pay mix than on pay level because even highly similar organizations may have different strategies regarding the basis on which they pay their employees.

> *Hypothesis 5: Organizational effects on pay mix are larger and less attributable to industry, size, and financial performance than organizational effects on base pay.*

Although we focused on realized strategy, we considered corroborative evidence about intentions to be useful. Organizations often state policies about both pay level and pay mix. Foulkes reported the following stated pay level policies as typical of those found in large, nonunion firms: "To be above the market; to be in the top 10%; . . . to be in the 65th percentile

nationally" (1980: 150–151). In addition, Weber and Rynes (1991), using a policy-capturing design, found that compensation managers who reported that their organizations followed a strategy of market pay leadership assigned higher pay rates to hypothetical jobs than other compensation managers did. Pay mix would seem just as likely to result from conscious decisions, given the administrative demands and lack of employee acceptance sometimes encountered with changes in such programs. Although data limitations prevented us from examining stated pay mix policies, we could examine stated pay level policies. We expected differences in the latter to demonstrate convergent validity with the stable patterns of pay level practices identified.

> *Hypothesis 6: Organizational differences in pay level not explained by personal, job, or specific organizational characteristics correlate with stated pay level policies.*

CONSEQUENCES FOR ORGANIZATIONAL PERFORMANCE

Although empirical evidence is scanty, researchers generally believe that pay practices have implications for organizational performance (Ehrenberg & Milkovich, 1987). In fact, in line with Pearce and Robinson's (1982) general description of strategic decisions, researchers have seen compensation decisions as strategic to the extent they have consequences for organizational success (e.g., Gomez-Mejia & Welbourne, 1988; Milkovich, 1988). Such consequences may result from the effects of pay practices on behavioral and cost objectives. Pay level and pay mix may influence those objectives in different ways.

Pay Level

Pay level may have its most direct effect on employee attraction and retention. Large companies may choose to follow a high-pay-level strategy to attract applicants and ensure their ability to be selective in hiring and retention decisions (Bronfenbrenner, 1956; Rynes & Barber, 1990). Expectancy theory suggests that the probability of receiving outcomes such as pay influences applicants' choices, and employees' decisions about whether to remain with an employer can be explained in a similar fashion. In addition, pay level plays an important role in both equity and discrepancy theory models of pay satisfaction. Perceived inequity and low pay satisfaction are associated with employees' leaving jobs voluntarily (Heneman, 1985).

In terms of cost objectives, perhaps the most visible impact of a high-pay-level strategy is the increase in short-run labor costs it entails. However, determining cost effectiveness or longer-run consequences for firm performance requires also considering whether a high pay level directly reduces other costs, such as the costs of search or of required staffing levels, or increases benefits through its impact on behavioral objectives like attraction and retention.

In summary, the theoretical effect of pay level strategy is unclear be-

cause many trade-offs are involved. However, because our study focused on the highest job levels—and thus on crucial employees—the positive effects of high pay levels on managerial quality should have important consequences for organizational performance. Thus,

    Hypothesis 7: High pay level is positively associated with organizational performance.

Pay Mix

Research in both psychology and finance has specified important motivational, and thus behavioral, consequences of pay mix. Expectancy theory predicts that motivation increases to the extent that a behavior is highly instrumental in achieving valent outcomes. A key question concerns the direction of the motivation desired. Compensation managers design compensation practices in the belief that different degrees of emphasis on individual, group, and organizational objectives will affect employee behaviors differentially. Advocates of expectancy theory argue that making pay contingent on attaining an objective increases its instrumentality and thus the motivation to achieve it. Merit pay plans and individual, group, and organizational incentives are ways of moving away from a strategy of regular increments to base salary toward a strategy in which pay varies as a function of achieving objectives. The goal of organizational and unit incentive plans is to encourage cooperation and communication between interdependent employees and groups (Lawler, 1981).

In the economics and finance literatures, agency theory starts with the assumption that the interests of principals (owners) and agents (managers) are not ordinarily the same. For jobs with low programmability (Eisenhardt, 1988), a principal may have difficulty determining whether an agent is pursuing the principal's goals. According to the theory, making managers' compensation contingent on firm performance will better align the agent's goals, and presumably, behaviors, with the owner's (Eaton & Rosen, 1983). Thus, both expectancy and agency theory emphasize the importance of making pay contingent on desired outcomes. Research on executive compensation (Baker et al., 1988; Murphy, 1985) has provided some support for this link. Moreover, firms with dominant stockholders seem to exhibit stronger links between compensation and financial returns than firms in which managers are dominant (Gomez-Mejia, Tosi, & Hinkin, 1987; Tosi & Gomez-Mejia, 1989).

Organizational and unit incentive plans are often seen as a means of making labor more a variable than a fixed cost. Fixed costs increase with base salary. But if a portion of employee pay is tied to firm performance, labor costs will be lower when the firm has less ability to pay and higher when ability to pay is higher and the organization may wish to recognize employees for their role in its success. Over time, the use of variable pay does not necessarily affect pay level.

In summary, expectancy theory and agency theory point to the positive effects of variable pay on behavioral objectives. Similarly, variable pay is

well-suited to achieving the cost objective of reducing fixed labor costs, especially important during periods of low product demand. Thus,

> *Hypothesis 8: The proportion of pay that is variable is positively associated with organizational performance.*

METHODS

Data

A large, well-known compensation consulting firm provided survey data collected from 1981 to 1985 on over 20,000 top- and middle-level executives and managers in over 300 business units and firms in each year. Roughly 95 percent of the companies designated themselves as freestanding. The consulting firm collected the data by sending an annual questionnaire to each organization requesting data on representative jobs, managerial levels, and business units. Each organization was encouraged to report data on at least 75 incumbents, and most did so.

The job families surveyed covered a broad range. Job incumbents included top executives, profit center heads, legal workers, and people in employee relations, manufacturing, marketing, finance, government relations, information systems, research and development and engineering, planning and acquisitions, general management, and materials handling. To give an example of the range of positions within the job families, in employee relations, data were collected on individuals ranging from top personnel executives with an average pay of $96,704 in 1985 to personnel managers, generalists under the direct supervision of top personnel executives, whose 1985 average pay was $60,821.

Analyses and Measures

Organizational effects on individual pay. To be included, an organization had to report data for at least three of the five years surveyed. In addition, only organizations in industries represented by three or more firms were included. These restrictions left data on about 14,000 individuals per year, for a total of 70,684 observations from 219 organizations over a five-year period.

Dependent variables were *base pay*, eligibility for *long-term incentives* (1 = yes, 0 = no),[1] and the *ratio of bonus to base pay*. We designed the last two measures to capture important aspects of pay mix. All monetary variables were scaled in 1980 dollars using the Consumer Price Index.

Human capital variables included years of education, years of potential

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[1] Information on the use of specific types of long-term incentive plans was not available. However, in a separate survey to which we did not have access, the survey company asked many of the same respondents to provide information on incentive stock options, nonqualified stock options, stock appreciation plans, performance plans, restricted stock, and phantom stock. Thus, respondents probably answered the question on which our dichotomous measure was based with such standard programs in mind.

labor market experience (age − years of education − 6),[2] length of firm tenure, and length of job tenure. We also used squared terms for the last three variables to test the human capital theory prediction that returns will diminish as experience increases, yielding negative signs on the squared terms.

Job characteristics measures were the number of reporting levels between a company's board of directors and a job and the number of management levels the job's incumbent supervised.

Organizational effects were measured using a dummy variable for each firm. Specific organizational characteristics were size, measured as firm sales, business unit sales, and total employees; return on assets (ROA);[3] and industry membership, measured as a company's two-digit Standard Industrial Classification (SIC) code. As noted, we only used data from industries represented by at least three firms. However, internal diversity in several two-digit industries and a sufficient number of firms within each of their three-digit industries allowed a further breakdown in some categories.[4]

The following equations were estimated:

$$Y_{it} = Z_{it}A + e_{it},$$ (1)

$$Y_{it} = Z_{it}A + X_{it}B + e_{it},$$ (2)

and

$$Y_{it} = Z_{it}A + W_{it}C + e_{it},$$ (3)

where

Y = a vector of observations on a dependent variable measuring compensation for i persons at time t, indicating that data are pooled across years,

Z = a matrix of observations on individual and job control variables,

X = a vector of dummy variables representing organizations,

W = a matrix of three organizational characteristics, industry, size, and financial performance,

$A, B,$ and C = coefficient vectors,

and

e = an error term that includes unmeasured causes of Y.

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[2] When a direct measure of years in the labor force is not available, economics researchers have used this formula to estimate the number of years a person could have participated in the labor force.

[3] We defined ROA as net income divided by assets. Other definitions are also possible, for example, earnings before interest, but after taxes, divided by assets (Brealey & Myers, 1981). To the extent that a bias is stable over time, the fixed effects model we used (described below) should eliminate the biasing effect of a particular definition. Moreover, as will also be noted, our formula yielded an average ROA for the companies studied that was the same as the 1985 *Fortune* 500's average ROA.

[4] The industry distribution is available from the authors.

Our approach was to take the increment in R^2 occurring between Equations 1 and 2 as indicating the general organizational effect. Then, by comparing this increment with that obtained by moving from Equation 1 to Equation 3, we were able to determine the extent to which the overall organizational effect was due to industry, size, and financial performance.

Stability and convergent validity. Because the data covered a five-year period, we looked for the first important evidence of stability in pay practices in the form of a significant effect in Equation 1 for the dummy variables representing organizations. Then, taking a second approach, we estimated Equation 1 for both 1981 and 1985 for the 137 companies for which we had data for both years. We averaged individual employees' pay outcome residuals for each organization in each year and took these adjusted averages as indicating an organization's relative position regarding base pay, the ratio of bonus to base pay, and eligibility for long-term incentives. If, for example, the average residual from the base pay equation was positive for a particular organization in a given year, we viewed the company as being above the market level defined by the organizations surveyed that year. Stability was examined by correlating these 1981 and 1985 adjusted averages.

Convergent validity was examined by correlating the average residual based on Equation 3, with base pay plus bonus as the dependent variable, with self-reported pay level policy. We obtained that information from the survey question "How do you define your target pay level?" (below the median, at the median, between the median and the 75th percentile, at the 75th percentile, above the 75th percentile). Because not all organizations provided these self-reports, and the survey did not elicit them before 1983, data from only 124 organizations were available for this analysis.

Consequences for organizational performance. Because short-term bonuses are designed to have their most direct impact on short-term performance, we examined the relation of ROA in year t with (1) the ratio of bonus to base pay and (2) base pay in year $t - 1$. We used average residuals based on Equation 1 for both compensation variables. The model was:

$$ROA_{it} = Z_{it}F + Base_{it-1}C + (Bonus_{it-1}/Base_{it-1})D + e_{it}, \qquad (4)$$

where

t = a year,
Z = a matrix of control variables (industry or prior ROA),
$C, D,$ and F = coefficient vectors,

and

e = an error term.

If high use of contingent pay has the effects expectancy and agency theories hypothesize, D should be positive and statistically significant. By including both base pay and bonus payments, we controlled for overall pay level, and the coefficients on each variable indicate the relative effects of money allocated to base pay and bonuses.

Different specifications of Z were used to address different questions.

For example, to estimate the relation between ROA and compensation practices within an industry, we employed dummies for the latter. To examine the relation controlling for prior profitability, we included ROA for year $t - 1$ in the matrix. However, controlling for prior ROA may have been unwise if, as our literature review implied, prior compensation practices influence prior firm performance.

To control omitted organization-specific causes of financial performance that remain stable in the short term, such as product demand, technology, legal framework, and employee attributes, we estimated a fixed-effects, or within-groups, model (Hausman & Taylor, 1981; cf. Gerhart, 1988) by including dummy variables for organization in the equation.

Finally, because long-term incentives are designed to improve business performance over the long run, we used average ROA over three years or more as the dependent variable, again with average residuals based on Equation 1 for the compensation variables. We included only organizations for which we had at least two observations ($\bar{x} = 3.7$) over three years beginning with 1981 or 1982 ($N = 159$). The model used was $ROA_{i.} = Incentive_{it-1}G + Z_{it-1}H + e_{i.}$, where . indicates an average over the relevant time period.

RESULTS

Organizational Effects on Individual Pay

Table 1 reports descriptive statistics using individual employees as the units of analysis. For several variables exhibiting nonnormal distributions, we used a natural logarithmic transformation. The means for these variables in raw 1980 dollars were \$4.9 billion for corporate sales, \$1.8 billion for unit sales, and \$71,155 for base salary. The mean number of employees per organization was 34,378. In 1985 dollars, the average corporation studied would place about 105th in the 1985 Fortune 500, and the average ROA for the group (6.1%) was the same as the average for the 1985 Fortune 500. Thus, although the companies we studied were not randomly selected, they appear typical of the Fortune 500 in some key respects.

Hypotheses 1a and 1b state that base pay and pay mix are related to human capital investment and job responsibility. Table 2, which provides results that explain differences in pay between employees across organizations during the study period, shows that human capital and job attributes explain statistically significant amounts of variance in base pay ($R^2 = .690$), the ratio of bonus to base pay ($R^2 = .238$), and long-term incentive eligibility ($R^2 = .205$). Thus, findings support Hypothesis 1a and 1b.

According to Hypotheses 2a and 2b, organizations should differ in base pay and pay mix, even after human capital and job factors are controlled. We added organizational dummy variables to the equation that already included the human capital and job attributes and again found significant total organizational effects on base pay level ($\Delta R^2 = .138$), the ratio of bonus to base

TABLE 1
Descriptive Statistics[a]

Variables	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. ROA	6.13	5.07																					
2. Firm sales[b]	14.33	1.29	-05																				
3. Unit sales[b]	12.63	2.01	-02	55																			
4. Number of employees[b]	9.82	1.26	-07	85	41																		
5. Base pay[b]	11.03	0.49	-01	41	42	35																	
6. Ratio of bonus to base pay	0.18	0.18	14	17	13	18	49																
7. Long-term incentive eligibility	0.60	0.49	05	19	18	21	50	34															
8. Education	16.41	1.89	01	14	25	14	27	12	18														
9. Potential experience	25.34	9.03	-05	13	08	12	32	16	11	-30													
10. Potential experience squared	723.77	469.46	-05	11	08	10	29	15	09	-31	98												
11. Firm tenure	15.10	10.47	-04	18	11	14	22	13	06	-23	63	63											
12. Firm tenure squared	337.66	393.06	-04	17	11	13	22	11	06	-33	63	65	90										
13. Job tenure	4.22	4.09	-01	-03	03	-03	03	02	-06	-07	39	40	36	33									
14. Job tenure squared	34.39	97.87	-01	-03	00	-03	02	01	-03	-04	24	26	23	22	78								
15. Management levels supervised	2.29	2.02	-01	21	11	20	71	43	36	05	25	23	21	21	-04	-01							
16. One level from board of directors	0.01	0.10	-00	-01	08	-02	33	15	06	04	11	12	08	09	06	06	32						
17. Two levels from board of directors	0.06	0.24	-01	-05	13	-06	35	20	14	09	09	09	03	03	02	01	23	-03					
18. Three levels from board of directors	0.20	0.40	-02	-07	14	-07	20	12	14	11	04	04	-02	-02	01	01	11	-05	-13				
19. Four levels from board of directors	0.31	0.46	00	-06	02	-06	-04	-02	04	03	-03	-03	-03	-03	-01	-00	-04	-07	-18	-34			
20. Five levels from board of directors	0.25	0.43	02	03	-11	04	-19	-11	-07	-07	-06	-05	-01	-02	-02	-02	-12	-06	-15	-29	-39		
21. Six levels from board of directors	0.12	0.33	01	10	-11	10	-20	-13	-16	-10	-04	-03	01	01	-01	-00	-12	-04	-10	-19	-25	-21	
22. Seven levels from board of directors	0.04	0.21	-01	10	-10	10	-15	-10	-15	-12	-01	-00	03	03	02	01	-09	-02	-06	-11	-15	-12	-08

Correlations

[a] N = 70,684; we adjusted dollar values using the Consumer Price Index to obtain 1980 dollars. Decimal points are omitted for correlation coefficients.
[b] This variable was measured as a natural logarithm.

TABLE 2
Organizational Effects on Compensation Outcomes[a]

Models	R^2	ΔR^2 [b]	ΔR^2 for Model C/ ΔR^2 for Model B[c]
Base pay			
A. Human capital and job attributes	.690		
B. Human capital, job attributes, and			
organizational dummy variables	.828	.138	
C. Human capital, job attributes, and			
organizational characteristics[d]	.784	.094	68.1
Ratio of bonus to base pay			
A. Human capital and job attributes	.238		
B. Human capital, job attributes, and			
organizational dummy variables	.452	.214	
C. Human capital, job attributes, and			
organizational characteristics	.318	.080	37.4
Long-term incentive eligibility			
A. Human capital and job attributes	.205		
B. Human capital, job attributes, and			
organizational dummy variables	.547	.342	
C. Human capital, job attributes, and			
organizational characteristics	.322	.117	34.2

[a] All R^2s and ΔR^2s are statistically significant at $p < .001$.
[b] Values shown are for the change in R^2 from Model A.
[c] Values are percentages.
[d] Organizational characteristics include firm sales, unit sales, total employees, ROA, and industry.

pay ($\Delta R^2 = .214$), and long-term incentive eligibility ($R^2 = .342$). Thus, there is support for Hypotheses 2a and 2b.

Hypotheses 3a and 3b state that specific organizational differences in industry, size, and financial performance can in part explain an organizational effect on employee pay. Table 2 also reports the incremental R^2s obtained with the organizational dummy variables removed and specific organizational characteristics added to the equation controlling for human capital and job attributes. The last column of Table 2 reports the percentage of the total organizational effect the specific organizational characteristics explain. For both base pay and pay mix, industry, size, and financial performance explain an important portion of the general effect, consistent with Hypotheses 3a and 3b.

Table 3 reports regression coefficients for the equation containing all the independent variables except the dummy variables for organizations. It is notable that base pay is positively related to size and, consistent with Deckop's (1988) findings, profitability. A one-point increase in ROA was associated with a .2 percent increase in base pay ($142), a .5 percentage point increase in the ratio of bonus to base pay ($355), and a .006 higher probability of long-term incentive eligibility. A 1 percent increase in firm sales was associated with a .1 percent ($71) higher base salary, a 1.6 percentage

TABLE 3
Model of Individual Pay Outcomes[a]

Variables[b]	Base Pay		Bonus-to-base Ratio		Long-term Incentive Eligibility	
	b	t	b	t	b	t
Intercept	7.740	413.6	−0.451	−37.6	−1.074	−32.5
Education	0.041	77.0	0.006	18.4	0.026	28.1
Experience	0.023	43.9	0.001	2.7	0.012	13.6
Experience squared	−0.0003	−24.9	0.000	0.4	−0.0002	−9.3
Firm tenure	−0.003	−9.2	0.004	18.0	0.001	1.3
Firm tenure squared	0.0001	9.2	−0.0001	−15.0	0.000	−0.7
Job tenure	−0.003	−9.0	0.001	4.8	−0.008	−12.8
Job tenure squared	0.0001	3.6	−0.0001	−5.1	0.0001	4.4
Management levels supervised	0.105	108.2	0.026	76.0	0.055	58.9
Level 1	1.049	99.4	0.151	22.4	0.221	11.8
Level 2	0.667	110.2	0.164	42.1	0.442	41.4
Level 3	0.388	77.6	0.106	33.2	0.402	45.7
Level 4	0.242	52.1	0.067	22.5	0.327	39.8
Level 5	0.147	32.2	0.039	13.3	0.249	30.8
Level 6	0.063	13.1	0.013	4.2	0.100	11.8
ROA	0.002	9.2	0.005	42.6	0.006	19.5
Firm employees	0.005	2.3	0.010	6.5	0.086	21.1
Firm sales	0.100	40.8	0.016	10.0	−0.031	−7.1
Unit sales	0.019	31.5	−0.003	−7.5	0.003	2.5
R^2	.784		.318		.322	

[a] Each equation also included dummy variables for year and industry.

[b] "Level 1" indicates a job one level from a corporation's board of directors. The other variables with "level" have parallel import. The last three named variables used logarithms.

point ($1,138) higher bonus-to-base ratio, and a .031 lower probability of long-term incentive eligibility.[5]

The lower probability of incentive eligibility in the firms that were large in terms of sales is consistent with Balkin and Gomez-Mejia's (1987) results and also perhaps with the idea that incentives play more of a role in new firms than in declining firms (Ellig, 1981). On the other hand, values for the other measure of pay mix, the bonus-to-base ratio, were actually lower in smaller firms. One explanation is that small firms more often have growth as a primary objective. An adequate short-term cash flow and incentives that encourage a long-term perspective enhance long-term investments to achieve growth. Although use of long-term incentives is consistent with these needs, short-run (typically annual) bonuses, in contrast, would not be helpful in protecting short-term cash flow or encouraging a long-term orientation.

Stability and Convergent Validity

Hypotheses 4a and 4b state that organizational differences are stable over time. Our finding (Table 2) that organization had significant effects on base pay and pay mix over a five-year period provides important support for this hypothesized stability. Taking another approach, in Table 4 we report stability estimates for the compensation outcomes using firm averages in 1981 and 1985. A key finding is the fairly high stability of organizational effects over the period for base pay ($r = .85$) and long-term incentive eligibility ($r = .70$). The bonus-to-base ratio is a partial exception to the general pattern of stability with its somewhat lower correlation ($r = .52$). As results in the second column of Table 4 indicate, controlling for human capital and job attributes left results largely unchanged. The stability we saw is all the more striking in view of the fact that fewer than 50 percent of the employees in the survey in 1981 were also included in the 1985 survey. Therefore, there is strong evidence of stability in at least two key aspects of compensation that is due to stability in policies and practices, not to stability in employees,[6] supporting Hypothesis 4.

It is not surprising that the bonus-to-base ratio exhibited less stability than the other measures. As Table 3 indicated, bonus payouts are closely linked to ROA, which was not very stable over the five-year period ($r = .09$). Given the instability in this key determinant (and perhaps in other determinants) of bonus payments, it would be surprising and even troubling to find much greater stability in the bonus-to-base ratio. After all, organizations use bonuses to make pay a variable rather than a fixed cost. Bonus payments that

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[5] In a "log linear" specification, multiplying a coefficient by 100 gives the percent change in the dependent variable associated with a unit change in the independent variable. In a "log-log" specification, the coefficient gives the percent change in the dependent variable for a 1 percent change in the independent variable. .

[6] Although the same employees may not be present, stability in such human resource practices as hiring criteria may result in employees' having similar attributes.

TABLE 4
Stability of Compensation Outcomes[a]

	Correlations Between 1981 and 1985 Average Individual Pay	
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Variables	**Unadjusted**	**Adjusted for Human Capital and Job Characteristics**
Base pay	.85	.85
Bonus-to-base ratio	.52	.31
Long-term incentive eligibility	.70	.68

[a] $N = 137$.

do not change from year to year with changes in performance are, in effect, nothing more than base pay.[7]

Hypothesis 5 states that compensation strategy differences will be most pronounced in the area of pay mix. As Table 2 shows, two relevant findings emerged. First, although it is clear that the organizational effect is smallest for base pay ($\Delta R^2 = .138$), organizational characteristics are best able to account for this effect ($\Delta R^2 = .094$), explaining 68 percent of it. In contrast, the larger organizational effects for the dependent variables measuring pay mix appear to be less attributable to industry, size, and financial performance, with 37 and 34 percent of the organization effects for the bonus-to-base ratio and incentive eligibility respectively explained. These findings, which suggest that the most significant differences in firm compensation decisions have to do with pay mix, rather than pay level, are consistent with Hypothesis 5. Even similar organizations appear to follow very different pay mix strategies.

According to Hypothesis 6, actual compensation outcomes should converge with reported policies. The correlation between average residuals for pay level—base pay plus bonuses—and reported pay level policies was .504, indicating that firms with pay levels leading or following those other firms used tended to report a parallel policy. Our empirically derived measure of pay level demonstrates convergent validity with the self-reported measure, providing direct support for Hypothesis 6 and thus for the existence of intended pay level strategies.[8]

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[7] Long-term incentive eligibility is more stable because it does not measure actual payments. Also, recall that Table 2 showed significant organizational effects on the bonus-to-base ratio. Perhaps real organizational differences in bonus usage can be more accurately measured over long observation periods because fluctuations in performance tend to cancel each other out. In contrast, susceptibility to fluctuations is likely to constrain correlations between single-year observations.

[8] Because the self-reported measure is based on a single respondent from each company and a single item, its reliability may be low, and therefore our reported correlation of .504 may underestimate the true convergence.

Consequences for Organizational Performance

The results reported in Tables 5, 6, and 7 use organizations as the units of analysis, allowing an examination of the breadth and diversity of pay practices across organizations. As Table 5 indicates, the mean of the bonus-to-base ratio was .20, with a range of .00 to .67. Supplemental data not fully analyzed for the present report indicated that about 95 percent of the organizations studied used either division performance or a combination of division and individual performance as the basis for bonus payouts. The mean organizational base pay in 1980 dollars was $70,235, with a range of $28,000 to $254,000. Finally, most employees included in the survey were eligible for long-term incentives ($\bar{x}$ = .58), although the organizations ranged from having none of their surveyed employees on long-term incentives plans to having all of them on such plans. Finally, the 25th and 75th percentile values for the three compensation variables indicated fairly normal distributions.

The estimates for the model of yearly ROA appear in Table 6. In no case is the coefficient for base pay statistically significant, refuting Hypothesis 7, which states that base pay level and organizational performance are positively related. In contrast, the coefficient for the bonus-to-base ratio is statistically significant in the first three specifications. Even with the within-organization fixed effects model including a dummy variable for each organization, the coefficient indicates that an increase in the bonus-to-base ratio of 10 percentage points is associated with an approximately 0.48 percent higher return on assets. These findings provide tentative support for Hypothesis 8, which states that a high proportion of variable pay is associated with good organizational performance.

However, controlling for prior ROA reduces the values and statistical significance of the coefficients. It is not clear how to interpret this result. It may suggest that the use of bonuses is spuriously related to subsequent performance because performance measures are correlated over time. But one reason for such correlation in the short term may be the effectiveness of the bonus payouts, or of contingent pay. If that is true, controlling for prior financial performance is misleading. Because the fixed effects model con-

TABLE 5
Descriptive Statistics for Compensation Variables, Organization Level[a]

Variables	Means	s.d.	25th Percentile	75th Percentile	Minimum	Maximum
Base pay	$70,235	$26,155	$51,000	$84,000	$28,000	$254,000
Bonus-to-base ratio	0.20	0.14	0.10	0.28	.00	0.67
Long-term incentive eligibility	0.58	0.36	0.23	0.92	.00	1.00

[a] N = 728 (on 219 firms).

TABLE 6
Models of Yearly ROA, Adjusted Compensation Variables[a]

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Bonus-to-base ratio	9.470†† (5.3)	6.825†† (3.7)	4.795† (1.9)	2.101 (1.3)	3.723 (1.4)
Base pay	0.586 (0.6)	.022 (0.0)	2.933 (1.1)	.186 (0.2)	2.605 (1.0)
Lagged ROA[b]				.451** (13.4)	.066* (1.7)
Industry	No	Yes	No	Yes	No
Organization	No	No	Yes	No	Yes
Intercept	5.779** (31.9)	7.196** (12.0)	4.989** (? 8)	3.118** (5.7)	4.574* (2.5)
R^2	.039	.214	.659	.376	.661

[a] $N = 728$ (on 219 firms); t-values are in parentheses.
[b] Variable was measured one year prior to dependent variable.
† $p < .05$, one-tailed test
†† $p < .01$, one-tailed test
* $p < .05$, two-tailed test
** $p < .01$, two-tailed test

trols for any factor that is stable over time, any stable organizational differences in profitability are accounted for,[9] even without explicit inclusion of lagged ROA. Thus, care must be taken not to overcontrol. We are inclined to lend greater weight to the equations that exclude prior ROA.

The results for long-term incentive eligibility appear in Table 7. Using mean ROA over the study period, a measure appropriate to a long-term focus, we obtained fairly consistent support across models for a positive association between use of long-term incentives at the beginning of the period and subsequent mean ROA. Specifically, an increase of 10 percentage points in the number of eligible executives was associated with a 0.17 to 0.20 percent higher mean return on assets. These results provide further support for the prediction that a strategy of high variable pay is associated with good organizational performance (Hypothesis 8).

DISCUSSION

We focused on the determinants and consequences of organizations' compensation practices. Using research on compensation strategy, we identified pay level and pay mix as key aspects of compensation. On the determinants side, we began by comparing two basic models. In the first, a model based on classical economic theory, human capital theory, and job-oriented theories (e.g., Thurow, 1975), compensation, particularly base pay, was a function of employee and job characteristics. Although the theoretical and empirical literatures on pay mix determinants are comparatively thin, we used a similar model as a starting point for assessing pay mix.

The second general model was based largely on research in compensation strategy and contingency theory, which has emphasized that environmental factors like industry membership, size, and financial performance may influence the design of pay systems but that considerable discretion also exists in such decisions. Thus, although we incorporated employee and job factors and the just-mentioned environmental factors in this second model, we additionally hypothesized that knowing the organization an employee worked for would significantly increase our ability to explain the individual's pay level and pay mix. Results supported this second model, suggesting that theories focusing only on individual, job, and environmental factors are not sufficient for explaining organizational differences in compensation practices.

Several types of evidence led us to interpret these unexplained organizational differences as indicating strategic differences. First, organizational effects on compensation were significant over a five-year period, suggesting that organizational differences were persistent. Second, test-retest correlations generally yielded a similar picture of stability, although the bonus-to-base ratio was less stable than either base pay or long-term incentive eligibility. The lower stability of bonus payments makes sense, however,

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[9] The correlation between ROA in adjacent years ranges from .48 to .70.

TABLE 7
Models of Mean ROA, Adjusted Compensation Variables[a]

Variables	Model 1	Model 2	Model 3	Model 4
Long-term incentive eligibility	1.896† (1.8)	1.357 (1.6)	1.996† (1.9)	1.838† (1.8)
Lagged ROA[b]		.1E4** (3.1)		.093 (1.6)
Industry	No	No	Yes	Yes
Intercept	5.536** (16.6)	4.335** (8.7)	6.748** (6.6)	5.739** (4.8)
R^2	.021	.079	.311	.325

[a] $N = 156$; t-values are in parentheses.
[b] Variable was measured one year prior to beginning of mean ROA period.
† $p < .05$, one-tailed test
†† $p < .01$, one-tailed test
* $p < .05$, two-tailed test
** $p < .01$, two-tailed test

because unlike base pay, bonuses are designed to be variable from year to year. As noted, repeated observations over an extended period did bear out persistent organizational differences in using bonuses.

Third, where data were available, as they were for pay level, we found evidence of significant convergence of pay strategy measures. A lower level of convergence would not necessarily be of great concern because the two measures may be appropriate for different purposes. However, it seems reasonable to assume that it is actual compensation outcomes, rather than management perceptions, that determine costs and effects on employee attitudes and behaviors. Given this focus, differences in actual compensation outcomes would seem to be the more appropriate indicators of differences in compensation strategy.

Fourth, pay mix, but not pay level, was positively related to subsequent financial performance. Researchers studying both compensation and general strategy have argued that a defining characteristic of strategic decisions is that they have consequences for firm performance. In this sense, we found pay mix to be a more strategic aspect of compensation than pay level. In summary, the four types of evidence that emerged suggest that even highly similar organizations may follow different pay strategies having different degrees of success.

Our work builds on previous research in several ways. For example, the beneficial effect of contingent pay on organizational performance that we found is consistent with experimental research on the effects of individual incentives on individual performance in predominantly manual activities[10] and with a recent single-firm study of managers (Kahn & Sherer, 1990). Our findings also extend the research on executive pay, which has tended to focus on a few top executives in each organization, usually only those for whom pay information is publicly available in a prospectus. In addition,

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[10] Lawler (1981) and Dyer and Schwab (1982) contain reviews.

although most of the research on executive pay has examined whether pay was related to previous firm performance, our findings also bear on compensation decisions' consequences for subsequent performance. Our finding that the use of short-term bonuses is linked to subsequent performance is consistent with the findings of recent studies (Abowd, 1990; Leonard, 1990). In addition, our work suggests that making many employees eligible for long-term incentives is associated with high organizational performance in the long run.

Although the economics literature has tended to focus on individual characteristics and to some degree industry differences, we found that organization made a substantial difference in pay level determination (cf. Groshen, 1988). Thus, as with much previous work (e.g., Brown, 1980), our research provides little support for compensating wage differentials theory. Further, consistent with arguments by Rynes and Milkovich (1986), our findings also suggest that economists' traditional focus on industry differences in pay level is also not sufficient for explaining organizational differences within industries.[11] In the case of pay mix, comparisons with previous research are difficult because important studies (e.g., Groshen, 1988) have not included it.

In fact, despite the heavy focus on pay level in previous field research on compensation, at least two of our findings suggest that pay mix deserves at least as much attention as pay level. First, organizational differences in pay mix were not only larger than those for base pay but also less well explained by industry, size, and financial performance. Second, pay mix was related to subsequent financial performance, whereas base pay level was not.

The finding that organizations differentiated themselves more in respect to pay mix than base pay level fits the argument that organizations have less flexibility in pay level decisions. Standard economic theories of competitive markets have suggested that strong forces work to limit discretion in the setting of pay levels. Increases in pay level lead, ceteris paribus, to product price increases, and thus to reduced competitiveness. Decreases in pay level may result in difficulties such as poor employee attraction and retention (and thus perhaps poor employee quality), and union activity. In contrast, although pay mix changes may also produce costs and roadblocks, such as increased administrative burdens and resistance to change, substantial changes in pay mix without dramatic changes in monetary or behavioral costs may be possible.

In answering the question of why pay mix, but not base pay level, was related to subsequent financial performance, two factors seem relevant. First, the variation in organizations' pay levels may simply be insufficient to establish such a link. For the reasons just discussed, the consequences associated with paying too little or too much may be so serious that organizations avoid risking experimentation with pay level strategies. In contrast, the

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[11] Dickens and Katz (1987) reviewed industry wage studies.

risks associated with changes in pay mix are less obvious and the potential benefits have been widely discussed. Both expectancy theory and agency theory suggest that making pay variable and dependent on the achievement of specific individual and organizational goals makes it more likely those goals will be realized.

Similarly, books on business strategy have recommended that companies consider changes to their pay mix, usually in the direction of increasing variable pay, to become more competitive (e.g., Kanter, 1989; Peters, 1987). According to Kanter, "There is a movement afoot in many companies to both control costs and motivate performance targeted to strategic objectives by changing the pay system to one with lower fixed wages and salaries but higher variable earnings opportunities" (1989: 264).

Several caveats should be kept in mind in interpreting our findings. First, although our results suggest the use of discretion in the design of compensation plans, it is difficult to separate differences for which intended strategy, organizational culture, coalition bargaining, and historical accident are variously accountable. Our focus on realized strategies (Mintzberg, 1978) was not conducive to measuring the relative role of each. However, our estimates of the net effect of organizational differences on pay decisions are probably on the conservative side because in controlling for different distributions of jobs and personal attributes we ignored the possibility that these distributions might themselves be outcomes of conscious human resource strategies. Our estimates of strategy effects may be similarly conservative.

Second, the positive relation between variable pay and subsequent ROA needs to be interpreted with caution. After some point, greater pay variability may have diminishing returns or even adverse effects. In addition, recall that the individuals studied were fairly high-level employees, people with relatively large amounts of decision-making power and potential impact on organizational performance. Even among such employees, pay was often partly contingent on individual performance rather than completely dependent on organizational performance. Employees lower in an organizational hierarchy have less potential impact on organizational performance than those higher in the hierarchy. Thus, although making pay contingent on general performance may help achieve short-run cost objectives, such a plan is less likely to achieve behavioral objectives at lower job levels. Gainsharing plans, which focus on the performance of smaller organizational units, might be a more viable option for achieving behavioral objectives (Schuster, 1986).

Finally, although the point estimates of the relation between ROA and compensation outcomes could be described as small, it is necessary to keep in mind that many factors determine an organization's ROA. It is not clear that any single factor is likely to have a large effect on ROA. Even small effects, however, may be substantial monetarily.

Future Research

At this stage of our work, we were able to examine financial performance using ROA, but not shareholder wealth. Although the two measures

are likely to be related, future research using shareholder wealth (e.g., Abowd, 1990) with other measures of financial performance would be useful. More broadly, researchers could define organizational effectiveness in terms of many other dimensions, such as survival, adaptability, and stakeholder satisfaction.

Future compensation research should also keep in mind that compensation decisions are only one, albeit an important, aspect of general human resource strategy (Dyer & Holder, 1989). It would be of interest to determine whether certain types of compensation strategies tend to be associated with particular types of selection, development, and employment stability systems. Further, it would be useful to know which combinations work best under different conditions. For instance, does a high pay level work best when combined with an effective external staffing and performance management system? Hiring mistakes would be especially costly with a high pay level. On the other hand, a high pay level can drive down selection ratios, and combined with a good selection system, may be an effective means of creaming an applicant pool (e.g., Bronfenbrenner, 1956; Rynes & Barber, 1990). Holzer's (1990) model may provide a starting point for comparing the costs and benefits of different pay level policies.

Although our study examined both change and stability in compensation decisions, a deeper examination of the reasons for each would be of value. Even though our fixed effects model provided valuable information on the role of changes in compensation variables, future research examining in more detail the reasons for such changes and investigating whether changes in other human resource practices typically accompany them would be of interest.

It would also be useful to examine cases in which compensation strategies remain the same even when environmental changes suggest that compensation changes might be advisable. In investigations of that sort, institutional theory might provide a useful framework. In essence, proponents of institutional theory have argued that "organizations are influenced by normative pressures" (Zucker, 1987: 443) arising from either their internal or external environment that "lead the organization to be guided by legitimated elements" (Zucker, 1987: 443) such as standard operating procedures and professional certifications. Legitimated ways of doing things may, however, persist long after the reason for their implementation is gone. In fact, resistance to change may be a consequence of institutionalization. But as Eisenhardt (1988) demonstrated examining retail compensation practices, it can be difficult to show that institutionalization is the reason for a lack of change. In her study, agency theory accounted for many findings as well as institutional theory did. Nevertheless, there may be additional applications of the latter in studying compensation.[12]

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[12] Of course, the idea that certain customs and practices become institutionalized is not new in the study of compensation but was a central theme in the work of the so-called postinstitutional economists of the 1940s and 1950s (Segal, 1986).

For instance, businesses can choose to emphasize internal consistency or market pricing. One view is that many organizations give great weight to internal consistency despite changes in their business environment that argue against such an emphasis (e.g., Kanter, 1989; Lawler, 1986; Levine, 1989). Kanter has suggested that consistency and associated bureaucratic support mechanisms like job evaluation came into being at a time when "oligopolistic bureaucracies" operated in a more stable world (1989: 265), but with increasing global competition and environmental turbulence, such an approach is a costly luxury that continues to be emphasized because it has become institutionalized.

Finally, we have little knowledge about organizational differences in or the possible performance consequences of many other potentially strategic aspects of compensation. For example, do otherwise similar organizations use different pay hierarchies? How does the basis for pay differ across organizations? What accounts for such variations? Where performance is the basis, are particular types of performance criteria—individual, group, unit, organizational—more effective than others? If so, under what circumstances? We hope our study provides a useful framework for examining such issues.

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PSYCHOLOGICAL CONDITIONS OF PERSONAL ENGAGEMENT AND DISENGAGEMENT AT WORK

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This study began with the premise that people can use varying degrees of their selves, physically, cognitively, and emotionally, in work role performances, which has implications for both their work and experiences. Two qualitative, theory-generating studies of summer camp counselors and members of an architecture firm were conducted to explore the conditions at work in which people personally engage, or express and employ their personal selves, and disengage, or withdraw and defend their personal selves. This article describes and illustrates three psychological conditions—meaningfulness, safety, and availability—and their individual and contextual sources. These psychological conditions are linked to existing theoretical concepts, and directions for future research are described.

People occupy roles at work; they are the occupants of the houses that roles provide. These events are relatively well understood; researchers have focused on "role sending" and "receiving" (Katz & Kahn, 1978), role sets (Merton, 1957), role taking and socialization (Van Maanen, 1976), and on how people and their roles shape each other (Graen, 1976). Researchers have given less attention to how people occupy roles to varying degrees—to how fully they are psychologically present during particular moments of role performances. People can use varying degrees of their selves, physically, cognitively, and emotionally, in the roles they perform, even as they maintain the integrity of the boundaries between who they are and the roles they occupy. Presumably, the more people draw on their selves to perform their roles within those boundaries, the more stirring are their performances and the more content they are with the fit of the costumes they don.

The research reported here was designed to generate a theoretical framework within which to understand these "self-in-role" processes and to suggest directions for future research. My specific concern was the moments in which people bring themselves into or remove themselves from particular task behaviors. My guiding assumption was that people are constantly bringing in and leaving out various depths of their selves during the course of

their work days. They do so to respond to the momentary ebbs and flows of those days and to express their selves at some times and defend them at others. By focusing on moments of task performances, I sought to identify variables that explained the processes by which people adjust their selves-in-roles.

Existing organizational behavior concepts focusing on person-role relationships emphasize the generalized states that organization members occupy: people are to some degree job involved (Lawler & Hall, 1970; Lodahl & Kejner, 1965), committed to organizations (Mowday, Porter, & Steers, 1982; Porter, Steers, Mowday, & Boulian, 1974), or alienated at work in the form of self-estrangement (Blauner, 1964; Seeman, 1972). As previously conceptualized and measured, these concepts suggest that organization members strike and hold enduring stances (committed, involved, alienated), as if posing in still photographs. Such photographs would show people maintaining average levels of commitment and involvement over time. This perspective has offered some valuable lessons about the individual differences and situational factors that influence the psychological importance of work to people's identities or self-esteem (Jones, James, & Bruni, 1975; Lodahl, 1964), about the degree to which they consider a job central to their life (Dubin, 1956), about their willingness to exert effort for and remain part of their organizations (Mowday et al., 1982), and about the alienating effects of social systems (Blauner, 1964).

The cited research has yielded some understanding of what types of variables influence how organization members perceive themselves, their work, and the relation between the two. The understandings are general: they exist at some distance from the processes of people experiencing and behaving within particular work situations. For example, researchers have measured job involvement attitudinally with a paper-and-pencil scale asking people how much they intertwine their self-definition or self-esteem with work (e.g., "The most important things that happen to me involve my work"; Lodahl & Kejner, 1965). Often enough, employee absence from work gauges job involvement behaviorally (Blau & Boal, 1987). Both measures are broad, context-free sweeps at how present people are at work, yet neither goes to the core of what it means to be psychologically present in particular moments and situations. Doing so requires deeply probing people's experiences and situations during the discrete moments that make up their work lives. Such probing relies on studying both people's emotional reactions to conscious and unconscious phenomena, as clinical researchers do (e.g., Berg & Smith, 1985), and the objective properties of jobs, roles, and work contexts, as nonclinical researchers do (e.g., Lawler & Hall, 1970)—all within the same moments of task performances. Doing so focuses attention on the variance within the average stances of involvement and commitment that people strike over time.[1]

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[1] Hackett, Bycio, and Guion (1989) proposed and used "idiographic-longitudinal-analytical techniques" to achieve a similar focus.

The specific, in-depth approach used here was designed to yield a grounded theoretical framework illustrating how psychological experiences of work and work contexts shape the processes of people presenting and absenting their selves during task performances. This conceptual framework was grounded in both empirical research and existing theoretical frameworks. Conceptually, my starting point was the work of Goffman (1961a), who suggested that people's attachment to and detachment from their roles varies. In the theatrical metaphor that Goffman employed, people act out momentary attachments and detachments in role performances. Behaviors signifying a lack of separation between people and their roles indicate role embracement, and behaviors pointedly separating them from disdained roles indicate role distance. Goffman's examples show his focus on nonverbal language: a traffic policeman at a rush hour intersection embraces his role, arms dancing and whistle blowing, and a father shepherding his son on a merry-go-round distances himself from his role, yawning and mock-grimacing (1961a: 108).

Goffman's work dealt with fleeting face-to-face encounters. A different concept was needed to fit organizational life, which is ongoing, emotionally charged, and psychologically complex (Diamond & Allcorn, 1985). Psychologists (Freud, 1922), sociologists (Goffman, 1961b; Merton, 1957), and group theorists (Bion, 1961; Slater, 1966; Smith & Berg, 1987) have documented the idea that people are inherently ambivalent about being members of ongoing groups and systems and seek to protect themselves from both isolation and engulfment by alternately pulling away from and moving toward their memberships. These pulls and pushes are people's calibrations of self-in-role, enabling them to cope with both internal ambivalences and external conditions.

The terms developed here to describe these calibrations of self-in-role are *personal engagement* and *personal disengagement*. They refer to the behaviors by which people bring in or leave out their personal selves during work role performances. I defined personal engagement as the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances. I defined personal disengagement as the uncoupling of selves from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally during role performances. The personal engagement and disengagement concepts developed here integrate the idea that people need both self-expression and self-employment in their work lives as a matter of course (Alderfer, 1972; Maslow, 1954).

Using these definitions to guide the research, I built on job-design research on relations between workers and the characteristics of their tasks (Hackman & Oldham, 1980). I combined that perspective with those focusing on the interpersonal (Bennis, Schein, Berlew, & Steele, 1964; Rogers, 1958), group (Bion, 1961; Smith & Berg, 1987), intergroup (Alderfer, 1985a), and organizational (Hochschild, 1983) contexts that enhance or undermine peo-

ple's motivation and sense of meaning at work. The research premise was twofold: first, that the psychological experience of work drives people's attitudes and behaviors (Hackman & Oldham, 1980), and second, that individual, interpersonal, group, intergroup, and organizational factors simultaneously influence these experiences (Alderfer, 1985a).

Following these premises, I focused on delineating the psychological conditions in which people personally engage and disengage at work. These conditions are psychological experiences of the rational and unconscious elements of work contexts. I assumed that those work contexts, mediated by people's perceptions, create the conditions in which they personally engage and disengage. The research thus focused on people's experiences of themselves, their work, and its contexts. My aim was to map across individuals the general conditions of experience that influence degrees of personal engagement. I sought to identify psychological conditions powerful enough to survive the gamut of individual differences. This article describes and illustrates the nature of personal engagement and disengagement and the three psychological conditions found to influence those behaviors. I focus specifically on the nature of the conditions and their individual, social, and contextual sources.

METHODS

Generating a descriptive theory grounded in the behaviors, experiences, and perceptions of organization members required constant movement between theory and data: data suggested theoretical hypotheses and concepts, which suggested further data collection needs (Glaser & Strauss, 1967). I thus developed the theoretical framework in one organizational context and then redeveloped it in a different context. I entered the first setting armed with the sketchy definitions of personal engagement and disengagement outlined above, the desire to identify relevant psychological conditions, and the premise that those conditions would be created at the intersection of individual, interpersonal, group, intergroup, and organizational factors.

Different research stances were taken in the two studies. In the first context, a summer camp, I was both participant and observer. In the second context, an architecture firm, I was an outside researcher. Becoming an outsider constituted movement on my part from a relatively high degree of personal engagement to disengagement. I capitalized on the difference by using myself as a research tool, much as a clinician would (Alderfer, 1985b; Berg & Smith, 1985), reflecting on my experiences of conducting the research to inform both the process of generating the theory and its substance. The difficulty was in distinguishing the general properties of personal engagement and disengagement phenomena from the specific, biased ways in which I experienced and analyzed my roles (Berg & Smith, 1985). Consulting an outside supervisor familiar with the psychological issues involved in conducting such research enabled me to work through the personal issues that crop up in and influence clinical research and to manage the dynamics of the relationships with organizations (Berg, 1980).

The two organizations were selected because of their differences on a number of dimensions. To generate widely generalizable understandings about personal engagement and disengagement, I needed to identify conceptual commonalities in widely diverging settings. The camp, a temporary system dedicated to the education and enjoyment of adolescents, had little hierarchical structure and was a total system in which work and nonwork boundaries blurred. Working there was physically exhausting for counselors, who were cast in constant care-taking and disciplinary roles. The architecture firm, a permanent system dedicated to constructing buildings, had rigid hierarchical structures and project teams and an ebbing and flowing rhythm based on projects and negotiations. The contrasts in what it was for employees to express, employ, and defend themselves as members of these two settings seemed huge. Those contrasts suggested the second setting as a counterpoint to the first.

Camp Carrib

Setting. Camp Carrib[2] was a six-week summer camp in the West Indies, attended by 100 adolescents, 12–17 years old, from relatively wealthy U.S. and Western European backgrounds. A staff of 22 counselors ran the camp. Counselors taught particular athletic skills such as tennis, scuba diving, and waterskiing and lived with and supervised campers. A head counselor and camp director were responsible for the general welfare of the camp and subject to the authority of its elderly owners who participated sporadically in its daily operations. The camp director was the eldest son of the camp owners; he was preparing to assume increasing ownership and control during the coming years.

Participants. Data were collected on 16 counselors, 9 men and 7 women, ranging in age from 20 to 35 years, with an average age of 25.5 years. They had been at this camp an average of two and a half summers; some were newcomers and others, eight-year veterans. They represented each camp program, from the largest (scuba diving) to the smallest (drama). The counselors were all at camp partly because they had the free time to do so. That is, they were students or teachers between academic semesters, free-lance scuba-diving instructors, or people taking summer sabbaticals from their usual lives to work temporarily as counselors. All counselors were white Americans (with the exception of one Briton) from middle- or upper middle-class backgrounds.

Data collection. I collected data using an assortment of qualitative methods: observation, document analysis, self-reflection, and in-depth interviewing. I was both a participant (the head tennis counselor) and an observer (the researcher). The camp's management agreed to my conducting the research before I joined the staff. I obtained the informed consent of the counselors at

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[2] I have disguised the names of the two organizations and their members to protect confidentiality.

the end of the precamp orientation period, prior to the arrival of the campers; after a series of questions, clarifications, and guarantees of privacy, all coun- selors agreed to participate.

The first three weeks of camp involved observations and informal con- versations meant to generate hypotheses and interview questions. I observed counselors in all types of situations, on-duty and off-duty, including task- related and social interactions with campers, other counselors, and camp management. Observations did not follow an explicit guide. I was looking for what I thought were examples of personal engagement and disengage- ment and for ways to explain those behaviors. I also sought clues in camp documents; the counselor handbook, the camp rules, and assorted camp brochures offered a sense of how the camp defined itself and the counselor role. During the second three weeks I interviewed the staff using questions based on the hypotheses I had developed. Interviews consisted of 24 open- ended questions designed to explore the counselors' perceptions of their experiences, involvements and lack thereof, roles, and the camp. The Ap- pendix gives all questions. Probes that asked people to extend their analyses followed the questions. I taped the interviews, which lasted between 45 and 90 minutes (averaging 65 minutes).

E.S.B. and Associates

Setting. The second research site was a prestigious architecture firm in the northeastern United States. The firm, owned and operated by the prin- cipal architect (whose initials, E.S.B., gave the firm its name), was staffed by 45 employees working as registered architects, draftspersons, interior de- signers, administrators, and interns. The firm was highly regarded, had won a number of design competitions and awards, and was growing more or less steadily into a large corporation faced with more projects than it could comfortably handle. The firm was structured around the use of project teams that formed and reformed according to the demands of various projects in different stages of production. The firm's owner (also its president) was the principal designer for each project, and a senior architect, usually one of four vice presidents, was in charge of implementing his design concepts. As a project developed, the senior architect would form a team. At the time of the study, the firm was quite busy, working simultaneously on over 30 projects and negotiating contracts for others.

Participants. I collected data on 16 firm members, 10 men and 6 women, choosing them for the diversity of their experiences, demographic traits, and positions in the firm. The participants had an average age of 34.3 years: 7 were between 24 and 41, 5 were between 32 and 44, and 4 were between 45 and 54. They also averaged 5.8 years with the firm: 4 had been there for less than a year, 5 between 1 and 3 years, 4 between 5 and 11 years, and 3 between 12 and 23 years. These employees represented all levels and posi- tions in the firm: I interviewed five senior architects, including the owner and the vice presidents; two designers; five draftspersons; two interns; and two support-staff members. All were white, American, and the products of

middle-class or upper middle-class backgrounds. This group represented the larger population of the firm's employees in terms of age (averaging 31 years), gender (33 percent women), and positions in the firm.[3] Their average length of job tenure was higher than that of the larger population of the firm, which was sharply deflated by its high proportion of young, relatively inexperienced unregistered draftspersons.

Data collection. The lengthy process of obtaining informed consent included attending a series of meetings with E.S.B. and the vice presidents, sending introductory letters to all employees, having telephone conversations with people who had questions or reservations about the project, distributing a contract letter cosigned by E.S.B. to all employees, and contacting members who agreed to be interviewed for the study. Data collection was structured around in-depth interviews. The interview format reflected the initial theory developed from the first study, translated into what I learned of the firm's language from the entry process (see the Appendix). After warm-up questions about an individual's job and work history and the firm, I asked participants to recall four different situations in which they had felt: (1) attentive, absorbed, or involved in their work, (2) uninvolved, detached, or distracted from their work, (3) differences between how they responded to a work situation and how they would have responded if they had not been at work, and (4) no differences from nonwork behavior in how they reacted to a work-related situation. I asked participants to describe and detail each situation, their behaviors and experiences, and how they understood or explained those experiences as best they could. The tactic of asking participants to in some sense relive particular situations reflected the phenomenological assumption that understanding psychological and emotional experience requires working from experienced realities to abstracted ideas (de Rivera, 1981; Kahn, 1984). Interviews were taped and lasted between 40 and 90 minutes (averaging 54 minutes).

Analysis

Data analysis occurred in three separate phases. The first phase occurred after the camp study. I transcribed and closely read interviews to identify what intuitively seemed to be moments in which people personally engaged or disengaged at work. I culled those experiences from the rest of the interviews as long quotations and analyzed them through an inductive process in which I articulated the characteristics that defined them as moments of personal engagement or disengagement. I then analyzed each experience to induce the psychological and contextual reasons why the counselors had personally engaged or disengaged. I was left with a set of categories of data, initial concepts to explain those data, and questions to guide the second study.

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[3] Occupational groups at the firm, in descending order of size, were: draftspersons, senior designers and licensed architects, model builders, administrative support people, vice presidents, associate vice presidents, interior designer, and president.

The second phase of data analysis, conducted after the study of the architecture firm, again involved transcribing interviews and identifying personal engagement and disengagement experiences. I sorted these data into the existing categories. The categories needed to change, however, to accommodate the new data and provide a base for a generalizable descriptive theory. The new categories reflected the greater complexity of both data and the concepts used to explain those data. With the greater complexity came sharper definition. The continuous movement between data and concepts ended when I had defined enough categories to explain what was recorded (Glaser & Strauss, 1967). The third phase of data analysis consisted of returning to the camp data and resorting and reanalyzing them in terms of the more complex categories and concepts.

In completing this cycle, I generated a collection of personal engagement and disengagement experiences. The examples were extended descriptions of moments in which people personally engaged or disengaged, pulled from the interviews and typed in their raw form on index cards. Each card included descriptions of behaviors, internal experiences, and contextual factors that described a specific moment of personal engagement or disengagement. I sorted experiences according to whether they clearly showed engagement or disengagement in terms of criteria given below. Examples that did not clearly fit either category were excluded. The collection finally included 86 personal engagement examples (40 from Camp Carrib, 46 from E.S.B. and Associates) and 100 personal disengagement examples (48 from Camp Carrib, 52 from E.S.B. and Associates). An independent coder similarly sorted a randomly selected sample of 60 experiences; there was 97 percent interrater agreement on the sortings.

These examples were used for statistical techniques that helped describe a model of personal engagement and disengagement. They did not serve to test the model; hypothesis testing relies on a stringent set of statistical assumptions that do not allow for generating and testing statistical assumptions from a single set of empirical observations (Hays, 1981). The descriptive statistics were based on my ratings of the extent to which the three psychological conditions described below were present in each of the 186 examples. Ratings were made on a nine-point format ranging from extremely absent to extremely present. An independent rater similarly rated a random sample of 36 examples, after hearing descriptions of the relevant psychological conditions and rating six practice situations. The rater was blind to whether those situations reflected personal engagement or disengagement. Correlations were calculated to determine the interrater reliability for each of the three scales. Correlations and statistics are presented below.

PERSONAL ENGAGEMENT AND PERSONAL DISENGAGEMENT

The conceptual framework presented here begins with defining and illustrating the concepts of personal engagement and disengagement that emerged from this research. Examples from the two studies and existing

theoretical frameworks elucidate the concepts. I describe pure forms of personal engagement and disengagement separately; these represent the endpoints of a continuum. People's behaviors may show mixtures of personal engagement and disengagement; for the purposes of clarity, I do not discuss those mixtures.

Personal Engagement

Personal engagement is the simultaneous employment and expression of a person's "preferred self" in task behaviors that promote connections to work and to others, personal presence (physical, cognitive, and emotional), and active, full role performances. My premise is that people have dimensions of themselves that, given appropriate conditions, they prefer to use and express in the course of role performances. To employ such dimensions is to drive personal energies into physical, cognitive, and emotional labors. Such self-employment underlies what researchers have referred to as effort (Hackman & Oldham, 1980), involvement (Lawler & Hall, 1970), flow (Csikszentmihalyi, 1982), mindfulness (Langer, 1989), and intrinsic motivation (Deci, 1975). To express preferred dimensions is to display real identity, thoughts, and feelings. Self-expression underlies what researchers refer to as creativity (Perkins, 1981), the use of personal voice (Hirschman, 1970), emotional expression (Rafaeli & Sutton, 1987), authenticity (Baxter, 1982), nondefensive communication (Gibb, 1961), playfulness (Kahn, 1989), and ethical behavior (Toffler, 1986).

The combination of employing and expressing a person's preferred self yields behaviors that bring alive the relation of self to role. People who are personally engaged keep their selves within a role, without sacrificing one for the other. Miner's (1987) discussion of idiosyncratic jobs in formal systems offers further insight into this phenomenon. Self and role exist in some dynamic, negotiable relation in which a person both drives personal energies into role behaviors (self-employment) and displays the self within the role (self-expression). Personally engaging behaviors simultaneously convey and bring alive self and obligatory role. People become physically involved in tasks, whether alone or with others, cognitively vigilant, and empathically connected to others in the service of the work they are doing in ways that display what they think and feel, their creativity, their beliefs and values, and their personal connections to others.

For example, a scuba-diving instructor at the summer camp taught a special class to advanced divers. He spent a great deal of time with the students both in and out of class and worked to share with them his personal philosophy about the ocean and the need to take care of its resources. In doing so, he experienced moments of pure personal engagement. He described one diving expedition in which he employed his self physically, darting about checking gear and leading the dive; cognitively, in his vigilant awareness of divers, weather, and marine life; and emotionally, in empathizing with the fear and excitement of the young divers. He also expressed

himself—the dimensions of himself that loved the ocean and wanted others to do so as well—during that expedition, talking about the wonders of the ocean, directing the boat drivers toward minimally destructive paths across the coral reef, showing his playfulness and joy underwater. The counselor was at once psychologically connecting with the campers and to a task that deeply tapped what he defined as important. In doing so, he was simultaneously fully discharging his role and expressing a preferred self.

At the architecture firm, a senior designer was involved in an important project during which such moments of personal engagement occurred. In one such moment, she employed herself physically ("I was just flying around the office"), cognitively (in working out the design-construction interfaces), and emotionally (she refused to give criticism publicly, empathizing with other people's feelings). At the same time, she expressed herself—the dimensions that hooked into the joy of creating designs both aesthetic and functional—by exhorting team members to think about how the clients would actually use the 'work, questioning the chief architect's assumptions about the design, providing criticism to others in ways both constructive and gentle, and working with the client as a collaborator rather than a "hired gun." At such moments, she behaved in ways that were both expressive of what she wanted to see acted out in the world and harnessed to the engine of task-oriented realities.

Personal Disengagement

Personal disengagement, conversely, is the simultaneous withdrawal and defense of a person's preferred self in behaviors that promote a lack of connections, physical, cognitive, and emotional absence, and passive, incomplete role performances. To withdraw preferred dimensions is to remove personal, internal energies from physical, cognitive, and emotional labors. Such unemployment of the self underlies task behaviors researchers have called automatic or robotic (Hochschild, 1983), burned out (Maslach, 1982), apathetic or detached (Goffman, 1961a), or effortless (Hackman & Oldham, 1980). To defend the self is to hide true identity, thoughts, and feelings during role performances. Such self-defense underlies what researchers have referred to as defensive (Argyris, 1982), impersonal or emotionally unexpressive (Hochschild, 1983; Rafaeli & Sutton, 1987), bureaucratic (Shorris, 1981), self-estranged (Seeman, 1972), and closed (Gibb, 1961) behaviors.

Personally disengaging means uncoupling self from role; people's behaviors display an evacuation or suppression of their expressive and energetic selves in discharging role obligations.[4] Role demands guide task behaviors without the interplay between internal thoughts and feelings and external requirements that characterize moments of personal engagement.

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[4] A different, related concept might be called "role disengagement"; this term refers to what occurs when people shed their roles as a way to uncouple self-in-role, avoid discharging role obligations, and simply be themselves.

People perform tasks at some distance from their preferred selves, which remain split off and hidden. They perform roles as external scripts indicate they should rather than internally interpret those roles; they act as custodians rather than innovators (Van Maanen & Schein, 1979). They become physically uninvolved in tasks, cognitively unvigilant, and emotionally disconnected from others in ways that hide what they think and feel, their creativity, their beliefs and values, and their personal connections to others.

Another senior designer at the architecture firm provided an example of disengagement, describing a moment in which he withdrew his energies physically, by farming out nonmanagement tasks to others; cognitively, by adopting an automatic, perfunctory approach marked by not questioning others' decisions, parameters, and design assumptions; and emotionally, by not empathizing with confused draftspersons and an upset client. He defended himself by displaying little of what he thought and felt within the conduct of the role. In working with the chief architect at that moment, he said little and waited to hear the other's responses; as he noted, "I exercised less than I probably could my own responses to something at that point, and had it be more how E.S.B. would respond." The designer suppressed what he himself thought and felt about the project. Anticipating and echoing the wishes of the president involved some presence of mind, but of a type that depended on disengaging his personal thoughts from his tasks. He refrained from investing ideas, encouraging the creativity of other team members, or sharing his visions about the design and excitement about the process, all of which could have shaped the building profoundly and helped it reflect the images and principles he held.

At the camp, a counselor personally disengaged during moments of teaching a windsurfing class. She reported withdrawing herself physically ("sending them out and just laying around"), cognitively ("not telling them much or helping them out much"), and emotionally ("I was more bland, superficial, talking in flat, unemotional tones"). At that moment, she displayed little of who she preferred to be by not letting herself connect with and get close to the campers. As she noted, "I was really shut down, not letting loose or being funny or letting them get close to me by talking more about myself. I just didn't let them in, I guess." Her personal disengagement meant withdrawing and defending herself from the types of interpersonal connections that defined who she typically preferred to be in her counselor role.

PSYCHOLOGICAL CONDITIONS

Overview

The studies reported here focused on how people's experiences of themselves and their work contexts influenced moments of personal engagement and disengagement. My premise was that people employ and express or withdraw and defend their preferred selves on the basis of their psychological experiences of self-in-role. This premise is similar to Hackman and

Oldham's (1980) notion that there are critical psychological states that influence people's internal work motivations. Here, the focus was on psychological conditions—the momentary rather than static circumstances of people's experiences that shape behaviors. These circumstances are like conditions in fleeting contracts; if certain conditions are met to some acceptable degree, people can personally engage in moments of task behaviors.

The three psychological conditions described and illustrated below were articulated through an inductive analysis that defined the experiential conditions whose presence influenced people to personally engage and whose absence influenced them to personally disengage. I analyzed each moment as if there were a contract between person and role (cf. Schein, 1970); the conditions of those contracts were induced, generalized across all moments, and connected to existing theoretical concepts. Three psychological conditions emerged: *meaningfulness, safety,* and *availability.* Together, the three conditions shaped how people inhabited their roles. Organization members seemed to unconsciously ask themselves three questions in each situation and to personally engage or disengage depending on the answers. The questions were: (1) How meaningful is it for me to bring myself into this performance? (2) How safe is it to do so? and (3) How available am I to do so?

The three conditions reflect the logic of actual contracts. People agree to contracts containing clear and desired benefits and protective guarantees when they believe themselves to possess the resources necessary to fulfill the obligations generated. That logic characterizes people's agreements to place increasing depths of themselves into role performances. People vary their personal engagements according to their perceptions of the benefits, or the meaningfulness, and the guarantees, or the safety, they perceive in situations. Engagement also varies according to the resources they perceive themselves to have—their availability. This contractual imagery helped make sense of the data on participants' experiences and offered a conceptual structure within which I could link the three psychological conditions.

A look at the characteristics of situations that shaped participants' experiences of themselves, their roles, and the relations between the two will elucidate the three psychological conditions. Experiences—of benefits, guarantees, and resources—were generally associated with particular influences. Psychological meaningfulness was associated with work elements that created incentives or disincentives to personally engage. Psychological safety was associated with elements of social systems that created more or less nonthreatening, predictable, and consistent social situations in which to engage. Psychological availability was associated with individual distractions that preoccupied people to various degrees and left them more or fewer resources with which to engage in role performances. Table 1 summarizes the dimensions of the three focal conditions.

Psychological Meaningfulness

Psychological meaningfulness can be seen as a feeling that one is receiving a return on investments of one's self in a currency of physical,

cognitive, or emotional energy. People experienced such meaningfulness when they felt worthwhile, useful, and valuable—as though they made a difference and were not taken for granted. They felt able to give to others and to the work itself in their roles and also able to receive. Lack of meaningfulness was connected to people's feeling that little was asked or expected of their selves and that there was little room for them to give or receive in work role performances. This formulation reflects concepts of how people invest themselves in tasks (Hackman & Oldham, 1980) and roles (Maehr & Braskamp, 1986) that satisfy personal (Alderfer, 1972; Maslow, 1954) and existential needs (May, Angel, & Ellenberger, 1958) for meaning in work and life.

The general link between personal engagement and psychological meaningfulness was explored with descriptive statistics calculated from the ratings of the 186 experiences I culled from the two studies. The statistics indicated that personal engagement was connected to higher levels of psychological meaningfulness ($\overline{x}$ = 7.8, s.d. = .84) than personal disengagement ($\overline{x}$ = 3.24, s.d. = 1.75; inter-rater reliability (r) = .89). These results suggest that people were personally engaging in situations characterized by more psychological meaningfulness than those in which they were disengaging.

The data indicated that three factors generally influenced psychological meaningfulness: task characteristics, role characteristics, and work interactions.

Task characteristics. When organization members were doing work that was challenging, clearly delineated, varied, creative, and somewhat autonomous, they were more likely to experience psychological meaningfulness. I induced that finding from the two studies and from previous research (Hackman & Oldham, 1980) focusing on how job characteristics such as skill variety and autonomy are a source of meaning in work.

An ideal situation for psychological meaningfulness, for example, was working on a rich and complex project. Meaningful tasks demanded both routine and new skills, allowing people to experience a sense of both competence (from the routine) and growth and learning (from the new). As a draftsperson at the architecture firm noted,

> The project I'm working on includes the restoration of a historical building, reconstruction of a demolished historic room, and an addition of a new building to an old one. That's a lot of complexity, and difficult as far as projects go. It's also the one that gets me excited about coming into the office.

Similarly, a scuba counselor noted,

> That class was one of the more difficult and rewarding I've taught here. It was a tough dive, because of the weather, and dangerous. I had to be so aware all the time of everything: the kids and their air supplies, the compass work, the swells and currents. It was tough, but it felt great when it was over.

TABLE 1
Dimensions of Psychological Conditions

Dimensions	Meaningfulness	Safety	Availability
Definition	Sense of return on investments of self in role performances.	Sense of being able to show and employ self without fear of negative consequences to self-image, status, or career.	Sense of possessing the physical, emotional, and psychological resources necessary for investing self in role performances.
Experiential components	Feel worthwhile, valued, valuable; feel able to give to and receive from work and others in course of work.	Feel situations are trustworthy, secure, predictable, and clear in terms of behavioral consequences.	Feel capable of driving physical, intellectual, and emotional energies into role performance.
Types of influence	Work elements that create incentives or disincentives for investments of self.	Elements of social systems that create situations that are more or less predictable, consistent, and nonthreatening.	Individual distractions that are more or less preoccupying in role performance situations.
Influences	Tasks: Jobs involving more or less challenge, variety, creativity, autonomy, and clear delineation of procedures and goals.	Interpersonal relationships: Ongoing relationships that offer more or less support, trust, openness, flexibility, and lack of threat.	Physical energies: Existing levels of physical resources available for investment into role performances.
	Roles: Formal positions that offer more or less attractive identities, through fit with a preferred self-image, and status and influence.	Group and intergroup dynamics: Informal, often unconscious roles that leave more or less room to safely express various parts of self; shaped by dynamics within and between groups in organizations.	Emotional energies: Existing levels of emotional resources available for investment into role performances. Insecurity: Levels of confidence in own abilities and status, self-consciousness, and ambivalence about fit with social systems that leave more or less room for investments of self in role performances.
	Work interactions: Interpersonal interactions with more or less promotion of dignity, self-appreciation, sense of value, and the inclusion of personal as well as professional elements.	Management style and process: Leader behaviors that show more or less support, resilience, consistency, trust, and competence. Organizational norms: Shared system expectations about member behaviors and emotions that leave more or less room for investments of self during role performances.	Outside life: Issues in people's outside lives that leave them more or less available for investments of self during role performances.

Meaningful tasks also allowed for some autonomy and the resulting sense of ownership over the work that previous research has noted (Hackman & Oldham, 1980). Such tasks were neither so tightly linked to nor so controlled by others that people performing them needed to constantly look for direction. Finally, the goals of potentially meaningful tasks were clear, allowing a good chance for success (cf. Locke, 1968). Clear goals were not always present in the architecture firm, where the ambiguity of the creative process was exacerbated by a president who would, in the words of one interviewee, offer "scribbles, bubbles, and waves" in design sketches and walk away, leaving behind more uncertainty than clarity.

Role characteristics. The data indicated two components of work roles that influenced the experience of psychological meaningfulness. First, roles carried identities that organization members were implicitly required to assume. Organization members could like or dislike those identities and the stances toward others they required; they typically did so on the basis of how well the roles fit how they saw or wanted to see their selves (Goffman, 1961a; Hochschild, 1983). At the camp, counselors both taught the campers, which required trust, and policed them, which required distrust. Counselors usually found one or the other identity—teacher or policeman—more meaningful, although at times they were frustrated by the paradox of needing to be both and found neither meaningful. In the architecture firm, there were also various identities that members hooked into psychologically to different degrees: designer, decision maker, and with clients, collaborator or competitor. Comments from the firm's receptionist illustrated the unattractiveness of her work role:

> The role I'm required to perform, sitting up here in front and smiling and typing and being friendly . . . it's all bullshit, it's just a role, and there isn't any satisfaction in it for me. I'm more than that, and I want to be seen as a person apart from the work I do. This eight or nine hours is a waste. damaging, I think, to my own growth and what I think about myself.

Roles also carried status, or influence. When people were able to wield influence, occupy valuable positions in their systems, and gain desirable status, they experienced a sense of meaningfulness. The underlying dimension was power and what it bought: influence, and a sense of being valued, valuable, and needed. People search for ways to feel important and special, particularly since they generally feel powerless in the world as a whole (Lasch, 1984). In these organizations, roles that allowed people to have a sense of shaping the external world, whether in the form of kids' experiences or concrete buildings, offered a sense of meaningfulness. As one draftsperson put it, "It's amazing for me to walk through a building and see this front entry vestibule or this stairwell, and like see me, see that I had an impact." A scuba counselor measured his influence differently:

> I have a lot of kids who ask for me as their instructor, who come
> up and tell me that they don't like the other instructors and want
> to be with me. They feel open about separating us. It's not great
> that that happens, but it's very gratifying for me.

Role status was important partly as an indicator to people about how central
to and needed in their organizations they were. Particular activities at both
organizations were less central than others and widely perceived as such,
and people performing those tasks were susceptible to feeling unimpor-
tant—particularly if others treated them as unimportant. A counselor in
charge of an unpopular program remarked, "I don't have my special place;
I'm just not special here to the kids." A support staff member at the firm
noted that although his job was essential if others were to do their work, "It's
treated as meaningless." Roles perceived as unimportant in an organiza-
tional constellation lacked the power to offer their occupants a sense of
meaningfulness.

Work interactions. People also experienced psychological meaningful-
ness when their task performances included rewarding interpersonal inter-
actions with co-workers and clients. In the two studies, meaningful interac-
tions promoted dignity, self-appreciation, and a sense of worthwhileness.
They enabled relationships in which people wanted to give to and receive
from others. As an architect noted,

> I would say that my involvement comes from individuals. It's an
> immediate, initial thing that happens, a connection that I make
> each time when I work with someone with whom I find some
> common ground, some shared ways of thinking about things. If
> I don't have that connection, it's tough for me to get going work-
> ing with them.

Such connections are an invaluable source of meaning in people's lives
because they meet relatedness needs (Alderfer, 1972): they allow people to
feel known and appreciated and that they are sharing their existential jour-
neys with others (May et al., 1958).

Meaningful interactions in the two settings often involved both personal
and professional elements and a looseness of the boundaries separating the
two. For the counselors, this meant interacting with other staff members not
simply as co-workers but as cohorts. The image that some counselors in-
voked was of a platoon in which individuals thrown together under extraor-
dinary circumstances develop emotional bonds transcending the relative
superficiality of the connections between typical co-workers. At the archi-
tecture firm, meaningfulness also came from interpersonal connections that
to some degree tapped people's emotional lives. That tapping occurred when
people felt as if they fit in some way with those with whom they interacted
and when people treated one another not as role occupants but as people
who happened to occupy roles (Hochschild, 1983). The distinction was im-
portant to how much dignity and self-esteem people felt at work.

Interactions with clients, whether campers or builders, were sources of

both gratification and frustration. Meaningful interactions allowed people to feel valuable and valued. They involved mutual appreciation, respect, and positive feedback. Client interactions reduced the sense of meaningfulness when they blocked the interpersonal connections allowing people to perform and enjoy their jobs. Camp counselors found meaningfulness diminished when the campers communicated a lack of care, respect, or appreciation for the counselors' work. As one counselor noted, "It's a question of whether they tap into me or not; you put the energy where it will be appreciated." Similarly, architectural clients who did not allow firm members to do the jobs for which they were trained or did not appreciate their efforts created relationships devoid of respect and meaningfulness. Organization members preferred to be psychologically absent in such relationships.

Psychological Safety

Psychological safety was experienced as feeling able to show and employ one's self without fear of negative consequences to self-image, status, or career. People felt safe in situations in which they trusted that they would not suffer for their personal engagement. This association reflects a tenet of clinical work stating that therapeutic relationships (Sandler, 1960), families (Minuchin, 1974), groups (Smith & Berg, 1987), and organizations (Schein, 1987) create contexts in which people feel more or less safe in taking the risks of self-expression and engaging the processes of change. In the two studies, situations promoting trust were predictable, consistent, clear, and nonthreatening; people were able to understand the boundaries between what was allowed and disallowed and the potential consequences of their behaviors. When situations were unclear, inconsistent, unpredictable, or threatening, personal engagement was deemed too risky or unsafe.

The general link between personal engagement and psychological safety was explored with descriptive statistics derived from the ratings of the group of 186 experiences. The statistics indicated that personal engagement was connected to higher levels of psychological safety ($\bar{x}$ = 7.7, s.d. = 1.21) than personal disengagement ($\bar{x}$ = 3.77, s.d. = 1.6; r = .83). These results suggest that people were personally engaging in situations characterized by more psychological safety than those in which they were personally disengaging.

The data indicated that four factors most directly influenced psychological safety: interpersonal relationships, group and intergroup dynamics, management style and process, and organizational norms.

Interpersonal relationships. Interpersonal relationships promoted psychological safety when they were supportive and trusting. Such relationships had a flexibility that allowed people to try and perhaps to fail without fearing the consequences. At the architecture firm, such relations were those in which members shared ideas and concepts about designs without feeling that it was dangerous to do so; they felt that any criticism would be constructive rather than destructive. At the camp, safe relationships were those enabling counselors to teach, shepherd, and discipline campers as they

thought best without needing to attend to other counselors' reactions. One counselor described that process:

> It's great to teach with John. Either one of us can make a mistake and back each other up and it's not an ego problem. If I make a mistake he'll come in and without saying you just made a mistake note that it can also be done another way. We play off one another that way instead of clashing, and it lets me teach my own way.

People felt safer in climates characterized by such openness (Jourard, 1968) and supportiveness (Gibb, 1961).

People did not feel such safety when they felt disconnected from others. A support staff member at the architecture firm noted of one designer that "with a glance he became a door; he put up this 'don't bother me' sign around him." Crossing such boundaries was perceived as unsafe. The staff member describing this relationship continued:

> When he puts up those walls, I know to stay away from him. But the problem is, I have to deal with him at some of those times. So we interact, but I keep it short, don't joke or anything. I did once and he went nuts. So I get monotonic, almost moronic, with him.

In such instances, threat reflects differences in position and power. Participants experienced relations among people representing different hierarchical echelons as potentially more stifling and threatening than relations with peers. Threats could be quite real. In the firm, superiors could deeply change or even end a subordinate's role. As one draftsperson noted,

> I'm pretty careful around Steve [a vice president], after he instilled a bit of fear in me. I'm minding my Ps and Qs. There's a testiness in his voice to me at times, and I have the sense that we're not communicating well. Because I'm in a very precarious position, I need to defer until I can figure out some better way of responding to him and working with him.

People were quicker to withdraw from potential conflict with members of higher echelons than they were to withdraw from conflicts with members of their own echelon.

Group and intergroup dynamics. The various unacknowledged characters, or unconscious roles, that individuals assumed also influenced psychological safety. Group dynamics were defined according to the unconscious plays that characterize the more conscious workings of organizations (Bion, 1961; Hirschhorn, 1988; Slater, 1966). Social systems have a mentality beyond the mentalities of individual members, connecting them by processes of unconscious alliance and collusion (Wells, 1980). In the context of a work group, members collude to act out plays that allay anxieties, conscious and unconscious. Such plays revolve, for example, around plots dealing with authority, competition, or sexuality and depend on organization members to

play informal, unconscious roles. Once cast into these roles, people vary in how much room they have to safely bring their selves into work role performances (Minuchin, 1974). In the two settings studied, different implicit roles were more or less safe or unsafe havens from which people could personally engage depending on how much respect and authority those roles received.

In the architecture firm, for example, a group dynamic cast the firm's president as a father figure. Participating in the play that the image implied, other members took supporting roles whose status, power, and safety varied according to their proximity to the "father." The data revealed for example, two firm members who occupied "mother" and "favored son" characters in their own and others' eyes, which created spaces in which they could safely personally engage. They referred to those roles in these comments:

> It's a family situation here, and I have a blind loyalty to him [E.S.B.]. I am a mother. I am the mother, here, which is hard sometimes, but it lets me interact with him and with others pretty much as I want to, within limits.

> I tend to be seen as the next generation of designers that he lays out. My designs aren't questioned as much as those of others, and I think it's because I'm seen as following his tradition but in my own way.

The firm's gofer emerged as the "bad son": he wore earrings, cracked jokes, dyed his hair red, and was seldom able to engage. He was frustrated with his inability to escape from the informal role in which he was cast—with his participation—and from which he found other parts of his self, such as the artist, excluded. In the same way, some counselors found themselves relegated to unattractive, supporting roles that reduced opportunities to safely engage.

The informal characters that people played partly reflected the identity and organizational groups they consciously and unconsciously represented to one another (Alderfer, 1985a). Members representing less powerful groups are often cast into unattractive, vulnerable roles, particularly in interactions with members representing more powerful groups (Miller, 1976; Smith, 1982). In both organizations, women spoke of situations in which it felt unsafe for them to personally engage because of what they experienced as men's undermining their role performances. One female counselor gave an example:

> There are times when I'm trying to get a girl camper to go to bed, and some male counselor starts flirting with the girl. It makes me look bad and undermines me incredibly. So I have to be 'the bitch.' If I didn't, and just dealt with the kids as I'd like to, they'd just hassle me and not listen to me.

Similar dynamics characterized relations between organizational subgroups. At the architecture firm, for example, people experienced differences along

the dimension of tenure at the firm. New and old members tended to define situations involving members of the other category as less safe, as the remarks of one old member illustrated:

> I feel like there's a handful of us that are the old guard, and the rest are brand new. Those of us that have been here a long time have a different kind of relationship with each other than those that are just right off the street. We know each other so well, so we can be silly with one another. I am less likely to be as loose or candid with the new people as I am with the older ones.

A similar split occurred between counselors associated with the different activities. Counselors who taught different skills were accorded different status by the campers, the management, and even one another, and an informal hierarchy was established. Scuba instructors, for example, occupied the top of the hierarchy due to the perceived glamor and professionalization of their sport, and activities like drama and photography occupied the bottom, reflecting the campers' relative disinterest in them. The hierarchy influenced the psychological safety the counselors felt. A waterskiing counselor, for example, said she was interrupted and publicly corrected at a camp meeting by a scuba instructor as she described the internationally recognized distress signal:

> I felt like a total jerk out there in front of everyone, and angry at him for doing that. I was still right—but I backed down, assuming that he knew more about it because he was certified and all that. They're intimidating sometimes, so I just don't want to hassle with them.

The lack of psychological safety in such situations and the resulting suppression of individuals' voices reflects the distribution of authority and power among groups in organizations (Alderfer, 1985a).

Management style and process. Supportive, resilient, and clarifying management heightened psychological safety. Leaders translate system demands and reinforce members' behaviors in ways that may create different degrees of supportiveness and openness (Louis, 1986). Like supportive interpersonal relationships, supportive managerial environments allowed people to try and to fail without fear of the consequences. In practice, this meant opportunities to experiment with new design techniques in the firm or new teaching methods at the camp. People also felt safer when they had some control over their work. Managerial reluctance to loosen their control sent a message that their employees were not to be trusted and should fear overstepping their boundaries. That fear was compounded when managers were unpredictable, inconsistent, or hypocritical. An architect offered an example of such inconsistency,

> He [E.S.B.] goes over my head all the time. He'll tell me to do one thing, and I'll take care of it—like with a client or a design—and

> then he'll go and change it himself. It's like he goes over his own
> head—it's hilarious. Like if he had the time, he'd come over and
> redesign anything, even while it's being built. Crazy.

At such times, it was difficult for people in both organizations to trust the constancy of their task assignments or the control given them. It was hard to feel safe enough to invest their selves at work in any one direction. People need to feel that their authority figures are competent enough and secure enough in their own visions to create paths along which subordinates can safely travel (Kahn, 1990).

Members' perceived lack of safety also reflected their discomfort with the "tones" of management. In the architecture firm, some members had difficulty with how management dealt with firm members during office meetings:

> I've come away from those meetings feeling like I can ask a
> question as long as it's not threatening or it's a simple technical
> question about how the firm works. Impertinent questions will
> not be tolerated and are palmed off with a sarcastic response—
> even though they say we can ask anything.

The ambivalence with which the firm's management simultaneously welcomed and avoided openness sent mixed and thus distrusted messages to firm members.

At the camp, the tone the director set was at times similarly undermining. He occasionally took a cruel tone with the campers, and counselors observing such behavior could not help but learn the lesson taught the campers: that at times the camp was not a safe, supportive, caring system in which to be a member. One counselor directly expressed this when she said, "After seeing how Kurt rips into some of these kids, I'm pretty careful about not saying much when he's around. I just don't trust the guy." People's discomfort with the security of a managerial environment at times set limits on how safe they felt in employing and expressing their selves.

Organizational norms. Finally, psychological safety corresponded to role performances that were clearly within the boundaries of organizational norms. Norms are shared expectations about the general behaviors of system members (Hackman, 1986). People that stayed within generally appropriate ways of working and behaving felt safer than those who strayed outside those protective boundaries. In this regard, safety meant not calling into question habitual patterns of thought and behavior that ensured predictability; questioning such patterns meant being treated as a deviant (Shorris, 1981). At the camp, safety was a matter of counselors' exerting appropriate amounts of energy in different activities and being appropriately trusting or mistrusting of campers. In the architecture firm, the important norms revolved around how much time and energy to give to certain projects, how candid or withholding to be in giving feedback and criticism, and how confrontational or reticent to be with clients.

Deviating from norms and the possibility of doing so were sources of anxiety and frustration, particularly for people with low status and leverage, as deviance is in most social systems. In the architecture firm, such norms were encoded into the design parameters the president set, which were known and reinforced throughout the firm. People reined themselves in or were reined in to conform with established parameters. A draftsperson described that process:

> How bold you're being creates a certain amount of anxiety. If you're doing something that is somewhat removed from the parameters that you think or suspect you're supposed to be working from, you get a little nervous. When that happens, I hunt around for someone to tell me what he [E.S.B.] would like. Or someone will come around and say no, he would never go for that. That's the bottom line.

In such moments, people focus almost exclusively on the external rules or cues governing the situation that will lead them through potentially dangerous thickets (Goffman, 1959). The analogous situation at the camp involved the extent to which counselors were encouraged to trust campers. A number of counselors described situations in which they were trying to, as one noted, "give the kids a break," but were countermanded by other staff members. Recalling such an incident, a counselor remarked that he "just stopped trying to trust the kids because it was more hassle than it was worth—it's easier to be the hardass, like the camp wants me to be." Norms regulate emotional as well as physical labor (Hochschild, 1983).

In the architecture firm, the physical office space starkly symbolized the ways that overstepping the boundaries of expected behavior felt unsafe. Wide open and without walls except for four-foot partitions, the office resembled an open-air maze of public work spaces. There was also a loft that looked like a balcony. The space suggested that people were at once actors and audience. Its openness symbolically placed them on a stage in which they were constantly exposed to the scrutiny of others. There was no backstage, no place in which they could doff all vestiges of role and use their own voices (Goffman, 1961b). The camp counselors similarly occupied a stage, playing to the camper audience. Openness came from the intimacy of a small, enclosed system in which there were no secrets. The implications for the use of personal voice were the same as in the architecture firm. As a counselor noted, "So many times you'd love to share something with another counselor, something you saw going on, but for whatever reason, you just can't say it because you know it'll get around." In contexts defined by a lack of protective boundaries, people chose to guard their selves by withdrawing when they felt unsafe. In the absence of external boundaries between self and others, people withdrew as a way of creating internal boundaries (Hirschhorn, 1988).

Psychological Availability

Psychological availability is the sense of having the physical, emotional, or psychological resources to personally engage at a particular moment. It measures how ready people are to engage, given the distractions they experience as members of social systems. In this study, people were more or less available to place their selves fully into role performances depending on how they coped with the various demands of both work and nonwork aspects of their lives. Research on stress (e.g., Pearlin, 1983) has often included a measure of self-assessment of ability to engage in coping strategies. Such components implicitly measure psychological availability.

The general link between personal engagement and psychological availability was explored with descriptive statistics performed on the ratings of the group of 186 experiences. The statistics indicated that personal engagement was connected to higher levels of psychological availability ($\bar{x} = 7.48$, s.d. = 1.04) than personal disengagement ($\bar{x} = 3.27$, s.d. = 1.56; $r = .81$). These results suggest that people were personally engaging in situations for which they were more psychologically available and disengaging in situations for which they were less available.[5]

The data from the two studies indicated that four types of distractions influenced psychological availability: depletion of physical energy, depletion of emotional energy, individual insecurity, and outside lives.

Physical energy. Personal engagement demanded levels of physical energy, strength, and readiness that personal disengagement did not, as Goffman (1961a) suggested in his studies of nonverbal role performances. This requirement was clear in moments of personal disengagement in which people were simply depleted. The camp counselor role was physically demanding, given the strength of the sun on the island and the campers' unbounded energy. As one counselor said, "I'm not used to being out in the sun. For the first two weeks I took a nap every afternoon, but I was still physically blown away. I just couldn't be up with the kids the way I wanted because I was just too zonked." Physical incapacity was less common in the architecture firm, but it did occur after long hours at a drafting table. A draftsperson described such incapacity:

> Doing any of these tasks here means sitting down for eight hours. You're sitting down doing these very precise drawings. Your back is bent over, you're staring. Your back, your neck, your

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[5] The similarity of the patterns of rating scale results for the three psychological conditions raised questions about the extent to which they were conceptually distinguishable. I therefore examined the correlations among the three conditions using the ratings of the 186 examples of personal engagement and disengagement experiences. The correlations were: meaningfulness and safety, .32; meaningfulness and availability, .42; and safety and availability, .57.

> eyes—you feel physically awful and mentally exhausted, and
> all you think about is going home.

At such times, people were simply worn out and unavailable to engage.

Emotional energy. Emotional ability to personally engage also influenced psychological availability. The premise is 'that employing and expressing the self in tasks requiring emotional labor takes a certain level of emotionality that personally disengaging does not (Hochschild, 1983). In the firm, the frustrations of trying to translate abstract design concepts into working drawings and building specifications were emotionally draining. An architect described such a situation:

> It's a combination of not knowing what the answer is and trying
> different solutions and being totally frustrated and exhausted, so
> you just pull out of it. I spent a few days working out one design
> problem and was never satisfied with what I was coming up
> with. I just got worn down, got more and more distracted. I
> walked away from it, my mind was a mess. I just couldn't do it
> anymore.

At the camp, the unceasing demands of the campers for attention were emotionally draining. A counselor noted,

> The kids just take it out of you after a while, and you've given
> them everything you have emotionally. Sometimes I just need to
> get away and have no demands on me to watch, to care, to give.
> I take walks then, down by the beach, and try to think and feel
> nothing.

At some point, people simply had nothing left to give and withdrew. People needed emotional resources to meet the demands of personal engagement.

Insecurity. Psychological availability also corresponded to how secure people felt about their work and their status. For individuals to express their selves in social systems, they must feel relatively secure about those selves (Gustafson & Cooper, 1985). Insecurity distracted members from bringing their selves into their work; it generated anxiety that occupied energies that would have otherwise been translated into personal engagements. One dimension of insecurity was lack of self-confidence, a particular issue for new, low-status members of both organizations. A new draftsperson voiced that insecurity:

> I was somewhat anxious about how the speed and quality of my
> work was comparing to other people at my level in the office.
> Was I doing it fast enough, was I doing it right enough? I think
> about that, being here only three months. Are they going to keep
> me, or throw me back because I'm too small? So at times I tend
> to worry more about how my work is going to be received than
> about the work itself.

Counselors withdrew from performing their roles as they would have liked

when they did not "want to step out of place," as one counselor said, or, as another said, they were "not sure about how much to put into the camp all the time." Being available was partly a matter of security in abilities and status and maintaining a focus on tasks rather than anxieties.

A second dimension of insecurity was heightened self-consciousness. When organization members focused on how others perceived and judged them—whether or not such judgment actually occurred—they were too distracted to personally engage. They would focus on external rather than internal cues (Goffman, 1959). This happened when people perceived themselves, consciously or not, as actors on stages, surrounded by audiences and critics, rather than as people simply doing their jobs. The self-consciousness preoccupied people, engaging them in the work of managing impressions rather than in the work itself. A designer offered an example of such preoccupation:

> I have to appear concerned and eager to work. I am a lot of times, but if you're not concentrating or showing that, people can get the wrong impression. Communicating with people means figuring out the best way to respond to certain situations. Just thinking: What are my communications like with this person now, who can I joke with and to what extent, and who shouldn't I joke with?

The stage-like quality of the two organizations exacerbated such self-consciousness. In the architecture firm, the physical space markedly resembled an open stage, complete with balcony; in the camp, the counselors were always performing for the camper audience.

A third dimension of insecurity was people's ambivalence about their fit with their organization and its purposes. This ambivalence could preoccupy people, leaving them little space, energy, or desire to employ or express themselves in moments of task performances. Their lack of commitment to the rather wealthy campers distracted some counselors at times. Firm members sometimes struggled with their commitment to the overall tenor of the design parameters and style set by the president, which one designer characterized as "blatant post-modernism." People struggling with their desires to contribute to the end goals of their systems became less able or willing— less available—to do so. It is difficult for people to engage personally in fulfilling work processes when organizational ends do not fit their own values, as research on organizational commitment has suggested (Mowday, Porter, & Steers, 1982). In dealing with such issues, people were already engaged in inner debates that spared little room for external engagements.

Outside life. People's outside lives, which had the potential to take them psychologically away from their role performances, also influenced psychological availability. Members of both organizations were at times too preoccupied by events in their nonwork lives to invest energies in role performances; research on work-family boundaries has attested to such distraction (Hall & Richter, 1989). Counselors involved with other counselors were dis-

tracted by those relationships; a counselor who taught sailing and was in an intimate relationship with another counselor noted, "I've been coasting a lot with the kids—my energy is just in other places right now." A variety of personal distractions similarly incapacitated members of the architecture firm. A draftsperson applying to architecture schools noted, "I just don't concentrate as well because I'm thinking about that whole process."

People's outside lives could increase their availability. At times, events in their nonwork lives "charged" organization members. A camp counselor referred to how his "emotional high" from meeting a woman at an island casino gave him "amazing amounts of energy to spend with the kids." A draftsperson talked about feeling confident about making a presentation because of recent successes as a graphic artist. In such cases, the looseness of the boundaries separating work and nonwork let people draw on energies generated outside their formal roles.

DISCUSSION

The grounded theory described here cuts across a number of different existing conceptual frameworks to articulate the complex of influences on people's personal engagements and disengagements in particular moments of role performances. Besides its concern with specific moments of role performances, the resulting framework has a core focus different from others currently used to explain person-role relationships. This core has a number of key dimensions: a simultaneous concern with people's emotional reactions to conscious and unconscious phenomena and the objective properties of jobs, roles, and work contexts; the primacy of people's experiences of themselves and their contexts as the mediator of the depths to which they employ and express or withdraw and defend themselves during role performances; and the self-in-role as the unit of analysis, a focus on how both person and role are enlivened or deadened during role performances. The research described here articulated and defined these dimensions in the service of moving toward a theory of people's psychological presence and absence at work.

Directions for Future Research

The grounded theory described here carries with it implications for future research that will extend its conceptual dimensions and usefulness for practice. An immediate research agenda involves three arenas: the interplay of the three psychological conditions; individual differences; and the connections of personal engagement and disengagement to concepts currently used to explore person-role relationships.

Interplay of psychological conditions. A primary aim of future research might be to develop a dynamic process model explaining how the variables documented above combine to produce moments of personal engagement

and disengagement. This exploratory research suggests that people tacitly deal with multiple levels of influences—individual, interpersonal, group, intergroup, and organizational—by examining them, at varying degrees of awareness, for what they imply about the meaningfulness, safety, and availability that characterize role performance situations. The question remains, How do the three conditions combine in particular situations to promote personal engagement or disengagement?

It seems likely that there are thresholds separating the levels of the three conditions that, taken together, promote personal engagement rather than disengagement. But how do those conditions coact to let people reach those thresholds? The coaction may be additive and compensatory: with the three conditions summed together, the strength of one may compensate for the weakness of others. Or it may involve a specific hierarchy: a person's experiencing a situation as extremely meaningful may compensate for a lack of personal availability, but the reverse may not be true. The coaction may also involve thresholds for each condition. People may have to feel minimal levels of meaningfulness, safety, and availability before their additive interplay can lead them across the threshold separating personal engagement from disengagement. Such questions, answered both qualitatively and quantitatively in future research, will offer a richer portrait of the processes by which personal engagements and disengagements are created.

Individual differences. The focus of this research was identifying psychological conditions general enough to explain moments of personal engagement and disengagement across individuals. Yet presumably, individual differences shape people's dispositions toward personally engaging or disengaging in all or some types of role performances, just as they shape people's abilities and willingness to be involved or committed at work. Presumably, too, individual differences influence how people personally engage or disengage, given their experiences of psychological meaningfulness, safety, and availability in specific situations. Consider, for example, people who experience particular situations as unsafe. Although certain dispositional factors may lead someone to perceive a situation as unsafe, it is intriguing to think about the individual differences that shape what people do when they feel unsafe. Future research will focus on the courage that enables people to take the risk of employing and expressing their personal selves when it feels threatening to do so. Charting the role of courage is another dimension of developing a process model of personal engagement and disengagement.

Conceptual connections. Another direction for future research involves connecting personal engagement and disengagement to existing concepts focusing on person-role relationships. Initially, this article suggested that although concepts such as involvement and commitment reflect average orientations over time as if in a still photograph, personal engagement and disengagement reveal the variance typically hidden in those averages. Regardless of levels of involvement and commitment, people still experience

leaps (engagement) and falls (disengagement). Future research will focus on examining both quantitatively and qualitatively the connections between the relatively static levels of people's involvement and commitment and the constant fluctuations of self-in-role.

The variance that these new concepts reveal derives from the different depths of people's selves that they bring to or leave out of their role performances. In this article, I have emphasized people's expressions, employments, withdrawals, and defenses of their personal selves as the mechanisms by which they connect their depths to role performances. Future research might focus more closely on those depths and how they are plumbed in the course of role performances. Here, I have drawn little distinction between the physical, cognitive, and emotional paths along which people personally engage and disengage. It is likely, however, that a hierarchy relates increasing depths of engagement to the investment of self along physical, then cognitive, and finally emotional dimensions. Kelman (1958) postulated a similar hierarchy of dimensions regarding people's compliance with, identification with, and internalization of attitudes. Exploring that proposition further will help articulate distinguishable levels of personal engagement and disengagement and offer a way to understand the complexities of possible mixtures of personal engagement and disengagement. An individual might, for example, express and defend, or employ and withdraw simultaneously.

Conclusions

The conceptual model developed in this research has a number of components, some better developed than others. I deliberately included a wide range of factors in the model, taking seriously the multiple levels of influences—individual, interpersonal, group, intergroup, and organizational—that shape people's personal engagements and disengagements. It is at the swirling intersection of those influences that individuals make choices, at different levels of awareness, to employ and express or withdraw and defend themselves during role performances. The research approach taken here was to focus on the discrete moments of role performances that represent microcosms of the larger complexity; those moments are windows into the multiplicity of factors that are constantly relevant to person-role dynamics. Focusing on specific moments of work role performance is like using the zoom lens of a camera: a distant stationary image is brought close and revealed as a series of innumerable leaps of engagement and falls of disengagement.

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APPENDIX
Interview Schedules

Camp Carrib

1. Why did you choose to become a counselor?
2. Are you comfortable here on the island itself, and with the people?
3. Do you like being a member of a camp system as a counselor?
4. Do you enjoy being with kids generally and these kids in particular?
5. What do you like most about being a counselor here, and why?
6. What aspects of being a counselor here are personally and emotionally involving for you? What really grabs you, involves more of you than other roles you've held?
7. How would an observer like me be able to see your personal involvement? What does it look like?
8. What do you dislike most about being a counselor here, and why?
9. What aspects of being a counselor here are personally and emotionally uninvolving, that is, just turn you off so you're working automatically?

10. How would an observer like me be able to see that uninvolvement? What does it look like?
11. How do you find the demands of the counselor role?
12. How much control and autonomy do you have here?
13. How challenging do you find your role and its demands?
14. When can you coast through the work? When do you have to really stretch?
15. How do you like the way that your role is designed?
16. For what behaviors are you rewarded here, and what are those rewards?
17. How free are you to perform the role as you wish, at your own pace and style?
18. Where are you in the hierarchy? Do you feel in the center here?
19. How do you find working within your particular activity?
20. What is your relationship to the camp management, personally and professionally?
21. What emotional support systems do you have here at camp?
22. How much do you want to be personally and emotionally engaged here?
23. How is that involvement influenced by your physical and emotional energy?
24. How does the staff group influence your role performances?

E.S.B. and Associates

Warm-up

1. What is your job here?
2. How long have you worked here? What did you do before this job?
3. Who supervises you, and whom do you supervise?
4. What do you like most about working here?
5. What do you like least about your working here?

Situation 1

I'd like you to think about a time when you've been attentive and interested in what you're doing, felt absorbed and involved. A time when you didn't think about how you'd rather be doing something else, and you didn't feel bored. One example of this, outside of the workplace, is when we go to movies and get involved with them to the extent that we almost forget that we're just watching a movie: we don't think about ourselves, and the other things that we could be doing. This also happens when we're working, that we get so wrapped up in what we're doing that we forget about other things. This can be when we're doing something by ourselves, like writing or drafting, or when we're working with other people. Can you describe a particular time when you've felt like that here at work?

Situation 2

Now I'd like you to think about a time when you've felt uninvolved in what you were doing, a time when you were, say, bored, distracted, or feeling detached. We can use the movie example again, where we go to movies that just don't engage us and we are aware that it's just a movie or that we would rather be elsewhere. This too happens when we're at work, when we're doing something or working with someone, and we're not particularly involved in it for some reason or another. Can you describe a situation where this fits you?

Situation 3

Now I'd like you to think about a time when you did experience a difference between your response at work and the way in which you would have responded had you not been at work. This would be a time when you had to leave out more of who you are because you were at work. It's a time when you felt the difference between how you think you would have acted

or reacted, based on your own personal experiences and feelings, and how you actually did act or react within the work situation. Can you describe a particular time when you've felt this?

Situation 4

Now I'd like you to think about a time when you felt like there wasn't much difference between your response at work and the way in which you would have responded had you not been at work. This would be a time at work when you left out less of who you are outside of work. It's a time when you didn't feel much difference between how you think you would have acted or reacted on the basis of your own personal experiences and feelings, and how you actually did act or react at work. Can you describe a particular time when you've felt this?

Closing

Is there anything that you want to add or stress that might help me understand the influences on when you do and don't feel involved or uninvolved here?

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"P²-FORM" STRATEGIC MANAGEMENT: CORPORATE PRACTICES IN PROFESSIONAL PARTNERSHIPS

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Strategic management in complex organizations involves understanding the appropriate relationship between a corporate center and its principal business units. The reported study examined that relationship in an unusual form of organization, large professional partnerships. Because the distinctive characteristics of such organizations limit the relevance of presently available models, we present a more appropriate alternative called the P²-form. Using a blend of qualitative and quantitative methodologies and data from large accounting firms, we illustrate properties of the new model.

Analysts of corporate strategic processes have distinguished two organizational levels: corporate centers and principal business units. Corporate enterprises structurally reflect these levels, and an understanding of strategic processes involves analysis of their respective roles and their relationship. We intend this article to connect to the established literature concerning these structural and processual issues (Armour & Teece, 1978; Berg, 1965, 1969; Chandler, 1962; Channon, 1978; Fligstein, 1985; Goold & Campbell, 1987; Govindarajan, 1988; Gupta, 1987; Pitts, 1976, 1977; Ramanujam & Varadarajan, 1989; Williamson, 1970, 1975).

The present work examined corporate strategic processes in a form of organization hitherto neglected by researchers—large professional partnerships (Mills, 1986). Because the distinctive characteristics of such organizations limit the relevance and applicability of presently available organizational models, we will propose a more apposite model, which we have called the P²-form.

The conceptual framework for this work, derived especially from Hill (1988) and Miller (1987), appears in the next section. Our position is that the

nature of an organization inevitably influences its strategic management processes, so a search for generic patterns may be misleading.

CONCEPTUAL FRAMEWORK

Academic concern with the role of corporate centers is hardly new. Reviewing the literature, Hill identified "three main dimensions" (1988: 404) commonly used in assessing relations between corporations and their business units: (1) through *strategic control,* business units develop a competitive strategy within parameters established at the center of their corporation; (2) through *market-financial control,* business units operate with corporately set financial targets linked to rewards and punishments; and (3) through *operating control,* corporate headquarters centralize control over operating functions such as marketing, production, and purchasing. In principle, organizations can use any combination of these three dimensions, but in practice particular combinations usually occur. One combination, which Williamson labeled the M-form (1970, 1975), brackets low corporate control over operating decisions and extensive use of market and strategic controls. A second combination, Williamson's H-form, links low corporate control on strategic and operating dimensions and a high level of market control. A third combination blends centralized operating control with some use of market and strategic controls. Hill (1988) concluded that firms using the last form are, in effect, centralized multidivisionals.

The broad purpose of the research cited has been to establish the prevalence of various organizational arrangements and their usefulness in particular settings. Thus, drawing on earlier work by Chandler (1962), Channon (1979), and Rumelt (1974), Hill went on to provide what amounts to a theory of structural development:

> Diversification appears to be a major factor stimulating firms to move from centralized to decentralized control types. Established theory suggests that the initial control type adopted is probably the holding company type. Greater size, diversification and internationalization, however, brings with it complexity which necessitates the introduction of more sophisticated control systems. At this stage during their life cycle firms probably shift to a full multidivisional type (1988: 414).

Hill recognized that various combinations of the three control dimensions are possible. His approach thus has a high degree of sensitivity to the configurations of control that corporations can use and moves beyond the oversimplistic classifications of previous writers. In the conceptual framework used here, we extended Hill's attempt to develop conceptual clarity by elaborating elements of each of the three dimensions.

Strategic Control

Strategy formulation is concerned with positioning an organization within its market context both in the medium and long term. From a corpo-

rate perspective, the role of the center is to interpret the threats and oppor-
tunities facing an enterprise in terms of its present and future capabilities
and competencies and to initiate actions affecting the ability of business
units to sustain or improve their positional fit.

Strategic control, therefore, concerns the extent to which a corporate
center defines for its principal business units the range and scope of mar-
keting initiatives within a framework of corporate goals that fix the units'
relative emphases and importance. A common form of strategic control is the
use of portfolio planning techniques in which a corporate center evaluates
the competitive positions of subunits with a view toward resource (espe-
cially capital) allocation decisions (Hill, 1988: 405).

Miller identified "three multifaceted dimensions of the strategic deci-
sion-making process: rationality, assertiveness, and interaction" (1987: 8).
Rationality refers to basing strategy on careful analysis, systematic scanning
of markets for problems and opportunities, and methodical planning and
articulation of strategies (Andrews, 1980; Mintzberg, 1981; Porter, 1980;
Quinn, 1980). Interaction refers to the degree to which decisions are the
product of negotiation and bargaining between constituencies of affected
interests seeking to enhance or maintain their shares of scarce, valued orga-
nizational resources. A critical element of interaction is the extent to which
decision making is consensus-based or individual and directive (Pettigrew,
1973; Wildavsky, 1977).

The third dimension, assertiveness, refers to the extent to which an
enterprise engages in reactive or assertive behavior and is prepared to as-
sume risk in pursuing a competitive advantage. With their distinction be-
tween "prospector" and "defender" strategies, Miles and Snow (1978) pop-
ularized this dimension. Because our concern was the relationship of cor-
porate centers to their business units, we did not use this dimension, which
is more relevant to the relationship between organizations and their market
contexts.

Market-Financial Control

Market-financial control is, in its starkest form, setting clear financial
targets for a business unit—such as the rate of return on investment or the
net profit expected—coupled with holding the unit to account for attaining
those targets.

According to Williamson (1975), the creation of market-financial con-
trol characterizes M-form organizations, in that designing performance tar-
gets, connecting resource allocations to those targets, and linking compen-
sation and bonuses to target attainment complement strategic controls. Sev-
eral researchers (Baysinger & Hoskisson, 1989; Goold & Campbell, 1987;
Govindarajan, 1988; Gupta & Govindarajan, 1984; Hill & Hoskisson, 1987)
have found that the nature of market-financial control varies across divi-
sionalized enterprises. This work has suggested that at least three dimen-
sions of market-financial control exist. First, there is the specificity with
which unambiguous performance targets are established for business units.

Second, there is the degree of tolerance in the process of accountability for meeting those performance objectives. Goold and Campbell gave a sharp illustration of a low-tolerance system of accountability: "We asked Malcolm Bates of GEC how many years a manager could fail to meet his budget before expecting to lose his job. His response was telling and only partly tongue-in-cheek: 'How many years? You mean how many months. He might last for six months or he might not' " (1987: 129). Other companies are more flexible and tolerant. On the basis of other interviews, Goold and Campbell noted that "If the centre feels that a business is strategically on track for the long term, it tends to accept deviations from particular goals and milestones along the route" (1987: 67).

Govindarajan wrote that organizations vary as to "the amount of emphasis that meeting budgetary goals receives during the ongoing process of evaluating the performance of an SBU's general manager" (1988: 831). This dimension, which he called budget evaluative style, is similar to the idea that tolerance about accountability varies across organizations. So too is Gupta's (1987) distinction between evaluations that use objective financial data strictly applied rather than subjective data that allow mitigating circumstances to justify unfavorable budget variance.

A third dimension of market-financial control that has emerged from recent research concerns the relative emphasis placed on short-term (one-year) and long-term performance. A recurring debate concerns the impact of alternative systems of corporate controls on the time orientation of subunit managers (e.g., Baysinger & Hoskisson. 1989). Here, in contrast to earlier work, the issue is not the effect of controls on decision behaviors but the period over which control targets are set. In this research, we were concerned with corporately prescribed time periods rather than with realized behaviors.

Operating Control

Hill (1988) defined operating control as the extent to which a corporate center is involved in basic functions like marketing and production. But the range of possible functional areas of interest to a corporate center is much broader than the rather restricted list Hill covered. Furthermore, Hill made little provision for distinguishing between companies that only seek corporate control over some functions and those that seek control over all. Pugh, Hickson, Hinings, and Turner (1968), for example, identified 16 functional activities involved in all business enterprises. One dimension of operating control, therefore, is the range of a corporate center's involvement in operating decisions, defined as the absolute number of functions in which the center intervenes.

Analytically, it is important to isolate activities of critical concern to corporate centers. Not all functions have equal importance, nor do they receive equal attention and emphasis. Thus, the second dimension of oper-

ating control of concern to us is the primary focus of corporate involvement as reflected in the time and attention a corporate center gives to various activities.

A third dimension of operating control is the degree to which corporate centers circumscribe their business units' discretion. Hill (1988) referred to such circumvention as centralization. Channon (1978), Goold and Campbell (1987), and Lorsch and Allen (1973) were also concerned with centralization. Hill and Pickering (1986) suggested that "organizational design is not so much about divisionalism as about decentralization" (1986: 38).

Configurations of Control: A Summary

We suggest, in short, that the relationship between a corporate center and its business units can be examined using three primary dimensions, each further differentiated analytically, as summarized in Table 1. It is the configuration of controls found in different organizational settings that is important, along with the reasons for any differences observed. Our research task was thus twofold: to uncover configurations and to explain them. The following section provides the context for understanding the configuration found in professional partnerships.

PROFESSIONAL PARTNERSHIPS

The nature of the enterprise inevitably influences the strategic practices of any organization. The form of enterprise of interest in the present analysis was the large professional partnership, as exemplified by partnerships providing accounting, legal, or medical services. In particular, we focused on the strategic practices of professional partnerships large enough to operate through a network of business units, excluding small and single-location professional partnerships from the analysis. Professional partnerships differ from other types of organizations in regard to two features: the structure of ownership and governance and the nature of the primary task. We elaborate these features below, using the accounting industry for purposes of illustra-

TABLE 1
Framework for the Analysis of Corporation–Business Unit Relationships

Dimensions	Elements
Strategic control	Rationality
	Interaction
Market-financial control	Specificity of targets
	Tolerance of accountability
	Time orientation
Operating control	Range of corporate involvement
	Primary focus of corporate involvement
	Decentralization-centralization

tion. However, we intend our thesis to have a general application to professional partnerships.

The Structure of Ownership and Governance

Partnerships differ from most other business firms because their form of ownership and governance is distinctive. In a typical business firm, shareholders are usually outside the organization and constitute a stakeholder group (Mitroff, 1983) distinct from managers and lower-level employees. A board of directors represents shareholders' interests and provides a bridge between them and the managers who are in control of the enterprise. In effect, there are divisions between ownership, management, and operational employees. In a partnership, by contrast, ownership, management, and operations are fused. A partner is an owner of a firm, is involved in its overall management, and is a key production worker. As Table 2, which gives data for the Canadian accounting industry, indicates, an organization employing fewer than 4,000 workers may have as many as 490 partners. As a result, partnerships develop unusual structural frameworks within which strategic practices must evolve.

Figure 1 shows the typical structure of a large accounting firm. The structure's dominant feature is that the national office of a firm,[1] the formal equivalent of a corporate headquarters, is controlled through a form of representative democracy. At the strategic apex (Mintzberg, 1979) is a partnership body, which generally meets at least twice a year and which elects an executive policy committee. The executive policy committee, drawn from the ranks of the partnership, is typically constituted to represent major functional areas, such as audit and taxation, and major geographical areas. Other committees, called national committees in Figure 1, are similarly constituted and are concerned with both major functional areas and managerial functions such as professional development, professional standards, and marketing. The important point is that the structural vehicles of the national office are committees comprised of partners drawn from the field, not, as in other business, individuals. These committees, moreover, are ultimately accountable to the full body of a partnership: individual partners thus figure at both the base and the apex of these organizations.

A second feature of the partnership form of organization is that employment at a national or international office is frequently a temporary contractual arrangement. National partners and national executive partners—the equivalent of the chief executives of other businesses—usually return to the ranks of local offices after one or two terms, a period of perhaps five or six years. Individuals are elected to the office of national executive partner and

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[1] The national offices of large international accounting firms are coordinated by an international office, although the scale of that office and the tightness of the coordination varies by firm. The role of the international office was not examined in this research.

TABLE 2
Canadian Presence of the Big Eight Accounting Firms in 1987[a]

Firms[b]	Partners	Professionals	Offices	Clients[c]	1988 Revenues[d]
Thorne Ernst & Whinney	490	3,035	57	152	270,000
Clarkson Gordon[e]	418	2,569	27	145	237,000
Deloitte Samson	322	2,288	56	83	184,000
Touche Ross	380	2,180	47	98	195,000
Coopers & Lybrand	281	1,991	21	138	192,000
Price Waterhouse	242	1,928	24	116	172,000
Peat Marwick	271	1,857	30	78	167,000
Arthur Anderson	56	1,067	7	25	77,000

[a] Source is *The Bottom Line* (April 1989: 6).

[b] Recent international mergers have restructured the accounting industry. Thus, Deloitte Samson has merged with Touche Ross, except in Britain, where it is to merge with Coopers & Lybrand. Arthur Young has merged with Ernst and Whinney, except in Canada, where Thorne Ernst & Whinney has merged with Peat Marwick to become KMG Peat Marwick Thorne and Clarkson Gordon has become the Canadian presence of the Arthur Young-Ernst & Whinney combine. A proposed merger of Price Waterhouse and Arthur Andersen was aborted.

[c] Number of clients from the largest 1,000 audited corporations.

[d] Revenues are expressed in millions of dollars.

[e] This firm is affiliated with Arthur Young.

in some firms are proscribed from serving more than two terms. Similarly, membership on the executive policy committee or a national committee is temporary.

A third feature of partnership organizations is that most professionals aspire to partnership and most partners practice at the local office level. The focus of the business and of the partners' commitment is the local, not the national, office. The idea of a career that progresses upward from local to national office is foreign to professional partnerships. It is the local office, the principal business unit, not the national office—the central headquarters—that constitutes the center of such an organization. National offices of professional partnerships are known to have difficulty recruiting staff members from local offices. Furthermore, career management practices like moving partners from small to larger practices to broaden their experience are very limited. Most partners develop locally based client portfolios and stay in one local office unless they themselves initiate a move. They become reluctant to give up an established client portfolio to move to an area in which they must virtually start from scratch in building a practice.

The Nature of the Primary Tasks

The dominant characteristic of the primary task of a professional partnership is that the work is done almost entirely by professionals. About 75–80 percent of the work force of such an organization is professional (see Table 2). Professional accounting involves applying prototypes learned through extensive training and experience to a series of complex situations.

FIGURE 1
Partial Structure of a Typical Large Accounting Firm[a]
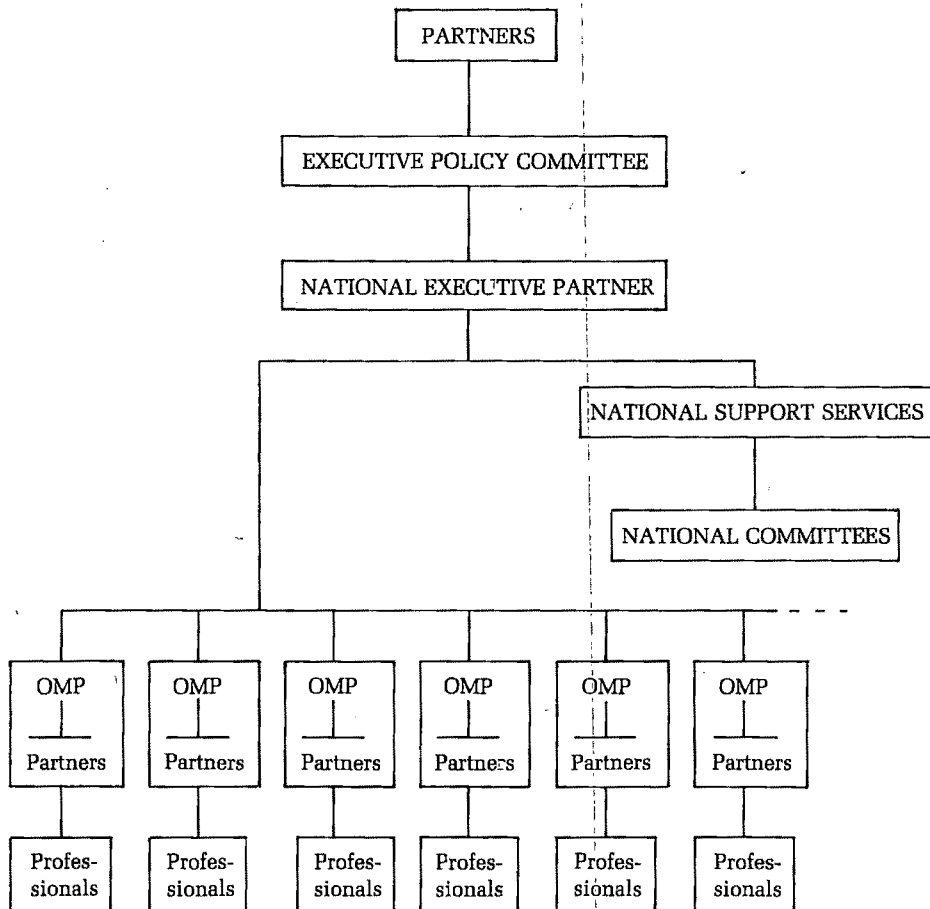
[a] This pattern is repeated in each principal country in which a large accounting firm operates. "OMP" represents a local office managing partner.

Application of a prototype requires sensitivity to its fit to a situation and the ability to make modifications through reference to abstract principles. Professional judgment relies on this combination of abilities.

Thus, an important feature of the accountancy task is that it is not amenable to close bureaucratic control. Control has to be exercised not through standardization of routines but through standardization of skills (Mintzberg, 1979). In addition, accounting is largely focused on individual professionals. Work responsibility is indivisible and cannot be decomposed into discrete sets of activities. Admittedly, there will be a division of labor between a partner and a support team; but essentially, the responsibility for an audit and accounting task requires treating the assignment as a whole, not

as a series of differentiated tasks. It is the "partner-in-charge" of an audit who signs off the completed work and is responsible to the client for the services provided.

In other words, the work of an accounting firm is based on professionals who are to a considerable extent self-contained. In Thompson's (1967) terms, there is pooled interdependence between the partners in an accounting office (Mills, 1986: 158). The strong psychological bond that develops with their clients compounds this professional independence: partners refer to "their" clients, and clients frequently prefer to see the same partner each year.

The link between clients and professionals points to another feature of the accountancy task, its geographical attachment. Clients prefer accountancy advisers located close to their business premises. And the search for new clients requires a professional to be integrated into and active in a local community. As a result, high geographical dispersion characterizes large accounting firms. Thus, seven of the very largest firms in Canada have between 21 and 57 local offices across the country, each office a virtually self-standing business responsible for its own marketing and production activities (see Table 2). Such enterprises cannot be concentrated in the same way as companies producing automobiles can: in an accounting firm, production and distribution cannot be separated.

Geographical differentiation, or variation in local offices' sizes (numbers of employees) and ranges of services, compounds geographical dispersion. An office in a major metropolitan center might hold several hundred people and handle large national and multinational accounts. A small urban center, in contrast, might have a handful of employees serving local accounts of modest size.

In summary, the task of accounting firms is professional in that it requires the application of professional knowledge to complex situations, and the work itself is individualized. geographically dispersed, and geographically differentiated. Given these features, it is not surprising that one national officer we interviewed described his accounting firm as an "archipelago of islands" and that another described the management task as "an exercise in molecular management."

Professional Partnerships: A Summary

 The distinctive mark of a professional partnership is the nature of the authority system that emanates from its primary task and becomes enshrined in the structure of governance. The distribution and basis of authority in autonomous professional organizations, with their emphasis on collegiality, peer evaluation, and autonomy (Blau, 1984; Bucher & Stelling, 1969; Montagna, 1968; Ritzer & Walczak, 1986) have long been identified as unique. Marcson described such a system as "a system of control in which authority is shared by all members of the working group," and continued with the statement "Authority is deemed to rest in the group rather than in the

individual." In a partnership, the professional system of authority is institutionalized in the ownership structure. The formal voting system underpins the equality of authority. Thus, individualized, autonomous day-to-day activities and collegial, group-based decision making on policy are combined. This juxtaposition makes the authority system very different from that of a corporation, with its institutionalized recognition of positional authority funneled to a strategic apex.

Our account of the characteristics of professional partnerships is broadly phrased. In practice, even collegial structures have elements of formal authority attached to administrative, hierarchically arranged positions; the national partners and the local managing partners occupy such positions in accounting firms. It is likely that certain individuals can use that formal authority to temper the tendency of collegial structures toward dispersed power and involvement. Not all local managing partners are primus inter pares. Nor do all partners have equal influence at partnership discussions. Nevertheless, the structure of authority in a professional partnership differs from that of a corporate enterprise and can be expected to constrain the nature and operation of strategic processes significantly.

Strategic practices in a professional partnership have to reflect and be sensitive to the uniqueness of the system of authority and nature of the work. The roles of central and local offices have to accommodate the professional values and expectations residing within the work place and represented in the governance structure. How do they do this? What is the configuration of controls used within professional partnerships to structure center–business unit relationships?

Propositions

With the framework we have established, a number of propositions can be advanced. The first derives from the highly professional nature of the work professional partnerships perform, which pushes toward decentralization of operating control. An extensive literature has shown the tension between professionals' drive for autonomy and the structures of bureaucratic organizations (e.g. Hall, 1968; Montagna, 1968; Scott, 1965). In a professional partnership, the individualized, indivisible work and a structure in which the authority of ownership buttresses the authority of professionalism reinforce these tensions and their decentralized resolution. The same effect—decentralization—will also result from high geographical differentiation and dispersion because it would be extremely difficult to centralize control, given the complexity of work sites and practices that typify such organizations.

> *Proposition 1: Decentralization of operating control will*
> *characterize professional partnerships.*

Decentralization of operating control is not total in any organization. Centers target key functional areas through selective and appropriate control techniques. In professional accounting firms, for example, two key, related

functional areas are quality control and professional development. Quality control—the maintenance of professional standards—is critical for both positive and negative reasons. Positively, a firm's reputation and thus its market effectiveness are linked to its ability to ensure common and high standards of performance across the firm. In a very real sense, the primary advantage for an individual partner of working in a national firm is the credibility and market legitimation the firm's name and reputation provide. It is in the interests of a partnership as a whole, therefore, to develop and protect the firm's reputation by ensuring high standards in each local office. Furthermore, partnerships are required by law to comply with prescribed standards (Dirsmith & Covaleski, 1985). Negatively, the partnership format makes each partner personally liable for acts of negligence wherever they happen in a firm. Lawsuits against the firm affect all partners as co-owners, not just the individual partner responsible or the local office in which negligence occurred. Such liability is of particular concern in a society characterized by an intensifying "urge to litigate" (Mednick, 1987: 119).

A partnership, in other words, is a form of association that protects professionals' independence, promotes and maintains professional standards, links market performance with firm reputation, and increases liability for professional negligence by others. Thus,

> *Proposition 2a: The primary focus of a central office's involvement in a professional partnership will be the development and maintenance of professional standards.*

> *Proposition 2b: Professional partnerships will have centralized control of the development and maintenance of professional standards.*

Proposition 2b is consistent with Channon's (1978) little-discussed idea of the "critical function" in service industries. Channon's analysis of eight service industries uncovered an organizational form that combined geographical decentralization of authority and centralization of the function critical to a given industry. For instance, in the insurance industry control over investment was centralized, as was control over buying in retail firms. Channon saw the critical-function form of organization when low product differentiation and high geographical differentiation occurred together—as they do in professional accounting firms.

What of market-financial control? The factors that affect operating control similarly affect financial control. Thus, the partnership form of ownership makes the earnings of each partner at least partly dependent on the revenue-generating capacity of all local offices. However, highly professionalized work forces will resist the elaboration of detailed cost structures and financial targets. Furthermore, the complex variety of economic and market circumstances across local offices attributable to their high geographical differentiation creates uncertainty that makes centrally determined, specific targets difficult to achieve and unlikely to be used (Govindarajan, 1988). The

presiding assumption in professional partnerships is that locally based part-
ners are better able to assess and exploit local contexts and opportunities
than are remote national officers. This assumption fits professionals' desire
for autonomy well. Therefore, although professional partnerships will use
market-based financial performance targets, they will be general ones. Thus,

> Proposition 3: Professional partnerships will use general
> market controls.

It follows that systems of performance appraisal will be tolerant, be-
cause without specific targets tight accountability is impossible. Moreover,
professional organizations have a strong service ethic and a strong concept of
community involvement and responsibility. Partnership implies a career
commitment, which is inconsistent with financial myopia and tight account-
ability. Thus,

> Proposition 4: Professional partnerships will have toler-
> ant performance accountability embracing both nonfi-
> nancial and financial targets.

Two further propositions concern the use of strategic control. The part-
nership structure of ownership essentially produces a dispersed rather than
a concentrated distribution of power (Hinings & Greenwood, 1988). Dis-
persed power, coupled with professionals' inclination to resist autocratic
actions and the territorial jealousies that arise in geographically dispersed
firms, militates against personalized, directive leadership. Furthermore,
large decentralized organizations are prone to politicalization of decision
making (Miller, 1987). These factors make the interaction pattern of strategic
decision making in professional partnerships negotiatory and consensual.
Thus,

> Proposition 5: A consensus-building approach to strategic
> decision making will characterize the pattern of interac-
> tion in professional partnerships.

The extent to which strategic decision making in a partnership will
assume the attributes of analytical rationality is less easy to anticipate. One
set of forces pushes toward a modest use of analysis at best. Professional
accountants do not treat their practices as "businesses." The very language
accountants use reflects a deliberate attempt to demarcate the corporate form
of organization from the national office form. The trappings of business
organizations—business plans, strategic thrusts, competitive analysis—have
not been part of accountants' traditional perspectives (Stevens, 1981). In-
deed, there is a sharpening debate over the appropriate manner of managing
partnerships.[2]

Professional tasks and the partnership pattern of ownership lead to low
or modest use of strategic analysis as a means of control. Geographical dif-

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[2] We have examined changes in the accounting profession and their implications for man-
agement in professional partnerships in detail in a separate paper (Greenwood, Hinings, &
Brown, 1990).

ferentiation and dispersion, moreover, create a complexity that further militates against the use of detailed analytic rationality (Miller, 1987). Thus,

> *Proposition 6: A low to modest use of strategic rational analysis will characterize professional partnerships.*

METHODS

Until recently, the worldwide accounting industry has been dominated by the so-called Big Eight accounting firms. In Canada, where the research reported here was conducted, the most recently available data show that affiliates of the Big Eight occupied the top seven positions in the industry and audited 95 percent of the *Financial Post*'s list of the top 400 industrial companies (Fry & Baltazar, 1989). Table 2 gives details of the Big Eight's presence in Canada at the time of our research. Recently, a series of mergers and planned international mergers, summarized at the foot of Table 2, has reduced the number of industry leaders.

The present study examined four of the Big Eight accounting firms. To identify similarities across professional partnerships that differentiate them from other organizations, we selected firms using two criteria. First, in order to uncover core similarities, we tried to encompass differences within the industry, choosing four firms whose approaches and forms of management differed, according to a panel of academic and practicing accountants. Core similarities across firms reputed to exhibit intraindustry differences is evidence of the existence of an archetypal approach for an industry (Greenwood & Hinings, 1989; Miller, 1981).

The second criterion for selection was the occurrence of a major change—reorganization, merger, rapid expansion, or change in senior personnel—within the previous five years. Patterns of work and values are thrown into relief and become more amenable to examination during changes and disturbances (Gephart, 1984). Two of the four firms examined had experienced a merger in the five years preceding our research, and three had experienced significant changes in senior personnel. Use of this second criterion exposed us to the risk of biased data, but since our broad purpose was exploratory rather than confirmatory, we regarded the risk as reasonable. However, after the empirical portion of the research was completed, we conducted discussions with representatives of three other accounting firms to assure ourselves that the analysis was an accurate account.

Data Collection

The approach adopted was a deliberate attempt to combine features and strengths of qualitative and quantitative procedures in order to address the requirements of reliability and validity (Kirk & Miller, 1986). Contemporary research has indicated that specific ideas and values characterize given institutional sectors (e.g., Child & Smith, 1987; Hinings & Greenwood, 1988; Huff, 1982). It is important, therefore, to understand a sector in order to make sense of its organizational and managerial practices. In order to obtain such

an understanding, we conducted the first phase of the research using a grounded theory process.

Information was collected in the four firms using semistructured interviews and documentary analysis. We conducted 252 interviews, each of up to two hours duration. All partners and a sample of not less than 50 percent of the managers, the employees immediately below partners, were interviewed in each local office. We interviewed all senior partners holding specific full-time positions located at a national office, obtaining descriptions of each respondent's role, how it interacted with other positions and roles in the organization, and the extent to which the national office influenced the role and its functioning. Attention was paid to the regularized processes of organizational activity, such as budget processes and human resource systems, as well as to more independent initiatives such as the reorganization of a local office or the development of new strategic directions.

Documents, including organizational charts, manuals of procedures, and business and marketing plans, were consulted where they existed at both the national and local levels, partly to confirm the descriptions interviewees provided but also as a significant source in their own right.

Following Kimberly (1987), we prepared summary reports for the national and local offices of each firm and, in three of the four cases, presented results at seminars. The summaries and seminars were a way of checking the accuracy and reliability of our interpretation of the data.

In effect, our initial research method was a qualitative effort to capture and preserve a rich appreciation of the phenomena under investigation. We sought to understand professional partnerships by eliciting the experiences and explanations of the actors themselves before analyzing and interpreting the organizations according to our preestablished conceptual framework. Such an approach permits great sensitivity to and understanding of a research setting (Morgan, 1983; Tomkins & Groves, 1983; Van Maanen, 1979), thus increasing confidence in the degree of validity of the findings obtained (Kirk & Miller, 1986: 29).

The qualitative phase of the research process led to the analysis and propositions outlined earlier in this article. We derived the description of strategic practices in professional partnerships and our explanation of those practices in terms of the characteristics of the task and the pattern of governance from grounded theory rather than deductive reasoning. However, we have summarized the description in the form of propositions because the second phase of the research sought to provide a measure of confirmation of our thesis.

Terms like centralization, decentralization, and low to modest usage, which appear in the propositions, are intended relatively. We suggest that, compared to other kinds of organizations, professional partnerships are characterized by decentralized operating control, centralized control of professional standards, and so on. Therefore we structured the second phase of the research, which sought to confirm the similarities and differences between professional partnerships and other forms of organizations, differ-

ently. We reassessed the four accounting organizations using instruments developed elsewhere whose reliability has been demonstrated and established. Use of such instruments permits direct comparison with previously published work on other industries and types of organizations. We collected information on five local offices in each of the four firms, including both large and small offices, through highly structured questionnaires completed by the local offices' current or former managing partners and validated this information by reference to the interviews with national partners. As we expected, the relationships between the national and local offices seemed to be standardized across the firms, with each local office subjected to the same pattern of controls. Informants reported alterations in national offices' patterns of intervention only in highly exceptional circumstances, such as when a rash of litigation struck a local office, or when serious quality defects had been consistently uncovered. It is therefore reasonable to assume that the material on the local offices examined is applicable across the firms.

The advantage of combining a qualitative phase with a more structured quantitative procedure is twofold. First, it enabled us to construct propositions pertinent to the context of the organizations examined. Second, and more fundamentally, it helped us understand and interpret the results of the questionnaire.

Measurements

Strategic control was measured using the questionnaire constructed by Miller (1987), following Khandwalla (1977). We asked key informants to indicate, on a seven-point Likert scale, the extent to which their office used four approaches in decision making and used consensus oriented team decision making. Bargaining was measured using Miller's one item on a three-point scale. We also measured the extent of the specificity of market-financial targets using Miller's questionnaire. Again, key informants indicated how much six control devices were used, on a seven-point Likert scale. We measured the extent to which goals were financial and used for tight accountability using Govindarajan's (1988) index of budget evaluative style, modifying the original language slightly in order to use the vocabulary of the accounting industry. For example, we used "national office" instead of "superior," and "local office" instead of "unit."

Measuring centralization-decentralization also followed the procedure reported by Govindarajan (1988). Using a seven-point scale, the managing partner of a local office indicated his[3] influence over five operating decisions that could affect the performance of the office (Vancil, 1980).

Table 3 reports means, standard deviations, and reliabilities, where appropriate, for these variables.

One difficulty with comparing data on professional partnerships with previously published data on other types of organizations is that it is im-

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[3] All of the managing partners of local offices interviewed were men.

TABLE 3
Means, Standard Deviations, and Reliabilities

Variables	Means	Standard Deviations	Alphas
Strategic control			
Rationality			
Analysis	2.72	0.78	.99
Planning	3.50	0.35	.88
Explicitness	2.75	0.83	
Scanning	3.25	0.43	.94
Interaction pattern			
Bargaining	2.75	0.43	
Consensual or individual decision making	5.75	0.43	
Market-financial control			
Specificity of financial targets	4.65	0.41	.61
Tolerance of accountability/budget evaluative style	2.50	0.50	
Operating control			
Decentralization	6.40	0.14	.50

possible to remove the influence of organizational size. Miller researched small to medium-sized nondiversified organizations with an average of 382 employees. Those organizations were smaller than the four accounting firms studied here, which, although also predominantly nondiversified, were geographically diversified. Govindarajan's research concerned *Fortune* 500 companies, organizations larger and more diversified than our accounting partnerships. These differences in sampling frames obviously make comparisons illustrative rather than definitive.

Comparison with published data also constrains the statistical applications that can be made. For example, the Behrens-Fisher problem of non-homogeneity of samples' variance, which is particularly apposite for small groups, inhibits the use of conventional tests of variance of sample means. Nevertheless, visual inspection of data (Tukey, 1977) can provide useful insights. Given our essentially exploratory purpose, the procedure we followed was reasonable and appropriate.

A further point is that although we conducted the structured data collection phase to permit comparison with previously published work, we took the opportunity to collect fairly structured data on three dimensions not covered in previous work, thus allowing for future comparative work. The first of these dimensions was the extent of operational decentralization, measured by the extent of the national offices' assertive involvement. The role of a corporate center and its relationship with a business unit is fundamentally different when the center reacts to initiatives from the business unit rather than taking initiatives to which the unit responds. For each functional area, we asked the local office managing partners to indicate whether utilization of national office resources was a matter of local initiative or of national office instruction. The greater the range of local initiative

(the number of times a national office was reactive), the lower the degree of centralization.

The second dimension was the range of corporate involvement in operating decisions, measured using the method established by Pugh and colleagues (1968); we designated a national office as involved in a function if a position or committee was formally responsible for that function. Data were obtained from organizational charts. We measured the third and final dimension, the primary focus of national involvement, by asking national and local partners to list the functions to which the national offices gave the most attention.

RESULTS

In presenting results, we have provided summary statistics, primarily for comparative purposes. In addition, we have given illustrations and interpretations to capture the feel of these organizations. Statistics are parsimonious and facilitate comparisons with earlier work, but the unusualness of the organizations under examination warranted using some measure of qualitative expression.

Operating Control

The data support the proposition that professional partnerships are decentralized. Consistently, the local offices of the four accounting firms had very high discretion over such decisions as expenditure for advertising and promotion, fee structures for audit engagements, expenditure on research and development, numbers of employees, and revenue targets for partners. The firms' average score for the five items was 6.4 (6.2–6.6). Govindarajan's (1988) average response, obtained from 121 *Fortune* 500 organizations in traditional industries, was 5.87 (s.d. = 0.93). The difference between the two sets of results is not large. However, each accounting firm falls in the predicted tail of Govindarajan's sample distribution, a highly unlikely chance occurrence having a probability of $.5^4$, or .0625. Thus, the proposition that professional partnerships decentralize operating control appears to be correct.

Operating control can be further examined using Table 4, which indicates whether firms had a national position or committee formally responsible for each of 16 functions. The range of involvement, shown at the bottom of the table, is the total number of affirmative responses per firm. This range appears to be fairly extensive: two of the four firms had central offices involved in 9 of the 16 functions, and the other two showed central involvement in 7 or 8 functions. Such a wide range of involvement does not confirm our impression of considerable operational decentralization. We resolved the apparent contradiction, however, by considering the degree to which the national offices initiated and directed functional activities. According to the results shown in Table 4, the national offices operated primarily in a reactive mode, involving themselves only at the request of local offices and actively focusing only on specific critical functions.

Two functions activated an aggressive national office stance. First was

TABLE 4
Range, Focus, and Nature of Corporate Functional Involvement

Functions	Firm 1		Firm 2		Firm 3		Firm 4	
	National Position or Committee?	Locus of Initiative	National Position or Committee?	Locus of Initiative	National Position or Committee?	Locus of Initiative	National Position or Committee?	Locus of Initiative
1. Public relations, advertising and promotion	Yes	Local	Yes	Local	Yes	Local	Yes	Local
2. Disposing of, distributing, and servicing firm output	No		No		No		No	
3. Carrying outputs, resources, and materials	No		No		No		No	
4. Acquiring and allocating human resources	No		No		No		No	
5. Developing and training employees	Yes	National	Yes	National	Yes	National	Yes	National
6. Assuring welfare and security of employees	No		No		No		No	
7. Purchasing and maintaining stock	Yes	Local	Yes	Local	No		No	
8. Maintaining physical plant	No		No		No		No	
9. Recording and controlling financial resources	Yes	National	Yes	National	Yes	National	Yes	National
10. Controlling work flow scheduling	No		No		No		No	
11. Conducting quality control	Yes	National	Yes	National	Yes	National	Yes	National
12. Assessing and devising methods of production	Yes	National	Yes	National	Yes	National	Yes	National
13. Devising new products and processes	Yes	National	Yes	National	Yes	National	Yes	National
14. Developing administrative procedures and requirements	Yes	Local	Yes	Local	No		Yes	National
15. Conducting market research	Yes	National	Yes	Local	No		Yes	Local
16. Managing legal and insurance requirements	No		No		Yes	National	No	
Range of involvement	9		9		7		8	

the financial function (number 9 in Table 4). Local offices were required to manage their accounts according to a system established by the national offices. This particular finding is not surprising since most companies insist on divisions' reporting and managing finances according to an established framework. As one national partner put it, "We're rather like their bank: they pay the money in and we process and invest it."

Much more distinctive of these partnerships was a strong national focus on creating and maintaining professional standards, which operated in several ways. For example, each firm provided centrally run training (function 5) that local office recruits were required to undergo. These courses, supplements to the training necessary for admittance to the profession, were a vehicle for socializing recruits into a firm's mode of operating. The national offices also took the initiative in developing new methods of production (function 12), or new accounting practices. Standards, too, were maintained through rigorous systems of inspection (function 11). The above methods indicate the national centers' emphasis on evolving and sustaining professional standards, supporting Propositions 2a and 2b.

An important feature of national office involvement in operational matters is the use of "clan control" (Ouchi, 1977), even in areas of active involvement. For example, quality control inspection was performed not by people based in the national offices, but by partners from local offices, thus sustaining the notion of collegial, nonhierarchical control. One local manager described the process as follows:

> Each year a number of local offices are selected for review. We were done last year. A partner from another office comes in and looks at a sample of our files to see whether we conformed with firm procedures and professional practices. I get a copy of his report and so does national office. I have to explain to them what I propose to do to rectify any problems. In addition, national office produces a composite report for the executive committee, outlining trends or common themes which require attention at the level of the firm.

For the functions that the national offices addressed reactively—public relations, stock control, and local marketing initiatives—the vehicle for involvement was a peer-based committee of local partners. For example, market research in one firm was the responsibility of an officer at the national office who administered and supported a series of task forces and teams looking at market opportunities in particular industries. Again, the task forces were composed of partners borrowed from the local offices. Often, a national office would promote and facilitate loose networks of geographically dispersed partners concerned with specific issues or problems. But in the end, the choice of whether to join a network, heed its advice, or use its expertise resided with local partners, except in the matter of quality control.

In summary, decentralization characterized operating control in these professional partnerships. Thus, we found support for Propositions 1, 2a,

and 2b. However, an array of support services were available to the decentralized units, and collegiate vehicles linked centers and local units. The role of the national offices was to reticulate rather than to control.

Market-Financial Control

The thesis put forward in Propositions 3 and 4 is that professional partnerships will have general targets and will emphasize both nonfinancial and financial goals linked to subjective, tolerant performance accountability.

Interestingly, as the data shown in Table 5 indicate, there again appears to be very little difference between accounting firms and other types of organizations in the use of market-financial controls. Compared to Miller's (1987) cross-industry average (4.85, on a seven-point scale), the average score for accounting firms (4.64) is unremarkable. As noted earlier, it is possible that differences in organizational sizes affected results. Since firm size affects scores on market-financial controls, with larger firms scoring higher, it is interesting that the four accounting firms studied here differed little from the smaller firms Miller studied.

There is also little difference between Govindarajan's (1988) average score on budget evaluative style (2.8) and that found for accounting firms (2.5). We cannot say that accounting firms tend to be more (or less) general in their use of goals and targets than other types of organizations or that the former use accountability systems that are more (or less) tolerant. On the contrary, the data imply that professional accounting partnerships are similar to small organizations in having modest to high scores on the use of specific targets but similar to large industrial organizations in how they evaluate performance. However, these summary statistics give only a partial impression of market-financial controls. Several notable features emerged from the interviews and qualify the interpretation of the structured data.

First, setting goals and targets for local offices was very much a bottom-up, negotiated process focusing on their annual budgets:

> In our firm, I [a local office managing partner] meet with the partners, and we come up with what we think is reasonable for next year. We have a good idea about local prospects, we decide to make particular efforts to land certain contracts, and we have

TABLE 5
Profile of Market-Financial Controls

Control Element	Accounting Firms					Miller's Firms		Govindarajan's Firms	
	1	2	3	4	Average	Average	s.d.	Average	s.d.
Specificity of financial targets	4.30	5.00	4.16	5.10	4.64	4.85	1.23		
Tolerance of accountability/budget evaluative style	2.00	3.00	2.00	3.00	2.50			2.80	0.91

> a feel for possible new business. The fact is that as long as our
> net revenues per partner are not significantly below the average
> for an office of our size, we will be left alone. I take the budget
> to the . . . National Office. At that point there is a meeting of all
> the OMPs and we are given a summary of likely income given
> the local plans. We have to decide if we like what the figures tell
> us and some discussion might take place with the national ex-
> ecutive partner. On the whole, however, as long as we are rea-
> sonable and meet expectations, it is our financial targets that
> matter.

The emphasis in the above quotation is very typical. The focus is on a budget
for one year, on being "reasonable," and on "our" targets.

Budgeting in accounting firms is essentially a matter of local partners
considering local opportunities and circumstances with a rule-of-thumb un-
derstanding of what is reasonable for an office of their size. Each local office
stressed that it set its own budget. The local offices have, as several inter-
viewees stated, an "understanding" of national office expectations. The
specificity of targets varied across firms; at one extreme, the local offices
knew that the national office had a profit target of "twice the rate of
inflation"; at the other, local offices set what they thought were "reasonable"
income targets. All budgets were "reviewed by" or "given to" a national
office, but the referral upward was as much a courtesy as a means of plan-
ning and control.

There was virtually no evidence of either national or local offices build-
ing into a budget explicit targets for market share or sector penetration.
Business planning by local offices seemed to be a relatively recent and un-
focused activity, either insufficiently developed or not intended to provide
a basis for sharp targets. Not one national office sought to specify targets for
portfolio expansion, market share, or industry penetration, except in the
most general way. The single document that constituted a plan against
which a local office could be evaluated was the one-year budget.

A tolerant system of accountability appeared to be crucial. Local targets
for income were not tightly enforced:

> In terms of a local office not reaching its target, there is a high
> degree of tolerance. The only expectation is that the local office
> puts plans into effect to rectify it [failure to reach income tar-
> gets]. *Peer pressure and pride are the main control factors in
> making a profit.* We share profits from coast to coast . . . it's all
> thrown into one pot. So we know who's not making their con-
> tribution. (Emphasis added.)

Interesting compensation agreements illustrate the degree of tolerance in the
accountability process. In the four accounting firms studied, each partner
received a guaranteed base salary (the range was from $40,000 to $75,000)
plus a draw from the national pool of profits generated by all local offices. A
partner's draw was the number of the individual's shares in the firm multi-
plied by the national profit and divided by the total number of shares. The

number of a partner's shares was a function of several factors, including experience, length of employment with a firm, revenue-generating success, responsibilities in the firm, and type of clients. There was no simple connection between number of shares and annual revenue generation. Furthermore, although in principle the compensation system could link individual performance with salary because a national office could distribute, or reallocate, shares to partners on the basis of individual performance, not one of the four firms tightly linked annual performance to pay (one firm was moving in that direction, however). When asked whether shares were reallocated, one national officer said, "Very gently . . . we seek to nudge people in a certain direction." Reallocation, if it took place, occurred in small steps and over time. A partner in a different firm referred to local office performance targets as a "moveable feast," with the implication that as long as net revenue contribution was "somewhere near" budget, the national office would be satisfied. When asked to define "somewhere near" the smiling response was "I've no idea!"

The short-term, annual focus of market-financial control can only be understood within the value context of these partnerships. Talking with partners repeatedly exposed the paradox of a formal system, the budget process, focusing on the short term combined with an assumption that the firm was in business to provide a high-quality service for the long term. Partners, many of whom expected to remain in the same locality throughout their careers, assumed long-term practice development but formally practiced short-term budgeting. In many ways, the local offices could practice short-term budgeting precisely because national and local office partners took for granted that the short term was subservient to long-term considerations.

The logic behind Propositions 3 and 4 is that tolerant accountability will characterize professional partnerships because they are concerned with long-term measures of performance that are not strictly financial. In formal terms, the structured data hardly confirm these expectations: these firms set annual financial targets. But the formal system gave great freedom to the local offices because by emphasizing financial targets rather than broader goals, it left the local offices alone to determine their marketing stance and predisposition. Further, the targets, though specific, were largely self-determined, and meeting them was not enforced. Thus, the extent of central market-financial control was weak despite its formal appearance. Thus, interpretation of the data supports the underlying logic of our thesis.

Strategic Control

Each accounting firm was below Miller's (1987) cross-industry average on the four elements of rationality, as Table 6 indicates. Again, this is highly unlikely to be a chance occurrence; the probability of that is .0625. Thus, there is less strategic analysis of opportunities and threats, less explicit and

TABLE 6
Profile of Strategic Controls

Control Element	Accounting Firms					Miller's Firms	
	1	2	3	4	Average	Average	s.d.
Rationality							
Analysis	2.80	2.30	1.80	4.00	2.85	4.12	1.30
Planning	3.50	3.50	3.00	4.00	3.50	4.29	0.91
Explicitness	2.00	2.00	3.00	4.00	2.75	4.72	1.39
Scanning	3.00	3.00	3.00	4.00	3.25	4.18	1.36
Interaction pattern							
Bargaining	3.00	3.00	3.00	2.00	2.75	2.62	0.53
Consensual or individual							
decision making	6.00	6.00	5.00	6.00	5.75	3.25	2.01

formal forecasting and planning of future options and directions, and less codification of analysis in these partnerships than in some other organizations.

The data, in other words, support Proposition 6, which states that low to modest use of strategic analysis as a form of control will characterize professional partnerships. We illustrate with reference to the marketing function, an area that demonstrated both the current vacuum in strategic analysis in these firms and, intriguingly, the embryonic emergence of a more substantive control. In an earlier section, we pointed out that the basis of marketing within professional partnerships is the individual partner, who develops a portfolio of clients by promoting contacts and relationships in a local economy. In many ways, portfolio development is a process of local initiative, with the role of the national office to assist and support: for example, a national office might act as a clearing house, putting partners in touch with accountants in other local offices with experience in a given industry; or a national office might produce background materials on a particular industry. Such marketing activities are not instances of strategic control but of support. But one firm's national office had pushed the marketing function to a different level, initiating industry specialization studies and at the same time attempting to persuade partners of the benefits of more focused, selective market thrusts. The firm's national executive partner bluntly reported its prevailing philosophy and problems:

> This is a helter-skelter organization. Accountants are not well-schooled in management skills. They think day-to-day: planning is not their strength. We are trying to change that. But we have to be very sensitive to the local office's view on local autonomy. We cannot push too hard. We have to be firm but flexible, persuade and cajole. And it helps if we don't bill them for our services.

In other words, the firm's present structural arrangements supported Prop-

osition 6, but there were elements of a desire to develop strategic control. As yet, those desires had not taken hold at the local office level (Greenwood, Hinings, & Brown, 1990).

Table 6 also shows that strategic decision processes in the accounting industry emphasize bargaining and consensus rather than individual direction and leadership. Each of the four accounting firms is in the predicted tail of Miller's distribution and at least one (in three cases, two) standard deviations above Miller's mean, confirming Proposition 5. We have already discussed the strong norms, emphasizing collegiality, given institutional authority in the pattern of ownership. We have also shown how the involvement of the center is usually through collegial structures and vehicles such as committees and teams. Consensual decision making, however, does not imply an absence of strategic leadership. The role of a national executive partner in a national office is without question one of leadership. However, the structural and ideological context within which national executive partners have to operate constrains the style they can adopt and the pace at which they can advance change. In these firms, strategic management and leadership is a matter of guiding, nudging, and persuading. A style like that of a Lee Iacocca is neither feasible nor likely to occur in a professional partnership. One respondent from a national office noted:

> I cannot simply tell them what to do. I have to persuade them, to convince them of my view of where we should go. Quite frankly, I don't have the authority to order the local offices to do this or that and I'm not sure if I would want to operate that way even if I could.

Another informant made the same point more succinctly, saying "Authority in a professional service firm is conferred upwards."

In a professional accounting firm, in short, strategic decision processes have to allow for both professional desires for autonomy and the expression of geographical interests. Bargaining, or structurally recognizing and accommodating constituencies of interests, and a search for consensus are proper recognitions of the configuration of ownership, professional ideology, and geographical differentiation in these firms.

THE P² CONFIGURATION

Our thesis is that professional partnerships constitute an organizational type by virtue of their distinct strategic management practices. The configuration of controls used by their centers differs from previously identified patterns such as Williamson's M- and H-forms of organization.

Table 7 gives the overt differences and similarities between partnerships and other organizational forms. M-form organizations have a clear separation of strategic and operating responsibilities, with the former occurring at the corporate center and the latter at the level of the principal business units or divisions. Corporate centers hold divisions accountable through a well-

TABLE 7
Comparisons of Strategic Management Forms

Configurations	Control Dimensions		
	Strategic	**Market-Financial**	**Operating**
1. Multidivisional: M-form	Strong capability Highly analytical Top-down orientation	Financial and nonfinancial targets Precise targets Tight accountability Multiyear orientation	Decentralized
2. Holding company: H-form	Weak capability Little used	Financial targets Tight accountability Precise targets Short-term orientation	Decentralized
3. Professional partnership: P²-form	Weak to modest capability Low analysis Consensus orientation	Financial targets Precise targets Tolerant accountability Explicit short-term and implicit long-term orientation	Decentralized Centralized control of standards and quality

developed set of internal (market-financial) controls, based on internal audits, cash flow, and capital allocations across divisions. Reward and incentive systems are centrally managed to link division managers' behavior to corporate goals. An H-form organization, in contrast, lacks the strategic capability of a multidivisional; as a consequence, strategic and operating responsibilities converge on its divisions.

The P²-form[4] shares with the M-form the separation of strategic and active operating responsibilities, except that the degree of strategic capability in a P²-form organization is much less well developed than it is in an M-form. Furthermore, in a P²-form operational control of the enterprise's critical function—maintenance and development of the quality of production processes—is centralized. The two forms also share reasonably well-articulated internal control systems, in that both establish performance targets and have vehicles for linking performance accomplishment with compensation. But the details of the control systems and their application differ significantly. In a P²-form, targets are essentially financial and set for one year at a time; more important, managerial behaviors are much less tightly manipulated through the appraisal and reward system than they usually are in an M-form.

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[4] The P²-form is used to emphasize that it is the combination of *professional* and *partnership* characteristics that distinguishes the organizations being examined.

The P^2-form, in other words, differs from the M-form in the process characteristics and the specificity of the strategic direction emanating from the corporate center of an organization and the tightness of the system of performance accountability. In an M-form, furthermore, strategic direction is authoritative, top-down, and enforced through specific, unambiguous control systems. In a P^2-form, strategic direction is weak, and the strategic process is one of negotiation, consensus building, and iteration. Implementing a strategic direction depends on wide-spread acceptance and professional conviction rather than on corporate manipulation of resources, rewards, and sanctions.

It would be wrong to suppose that this configuration of strategic, market-financial, and operational controls alone characterizes the P^2-form of strategic management. Equally important is a consistent emphasis on the structural use of collegial vehicles as the basis of organization. Professional partnerships, because of their governance arrangements and the work that they do, are organized differently from corporate bureaucracies. These structural differences are not simply a matter of building and extending the range and scope of lateral devices to try to increase a firm's information-processing capability (Galbraith, 1977), although partnerships certainly obtain those advantages. Collegial vehicles in professional partnerships, whether they are committees, task forces, or individuals, represent attempts to provide alternatives to hierarchical authority. In a professional partnership, the motivation behind the use of committees and task forces is to respect professionals' desires for autonomy, to maintain the principle of partnership, and to promote acceptance and cooperation. Two other aspects of partnerships clearly reflect this motivation: career structures do not converge upon a firm's national office and appointments to positions of authority are usually temporary. These are not insignificant differences.

The P^2-form is neither an aberration nor less appropriate, within its own context, than the M-form, despite the latter's supposed superiority (Armour & Teece, 1978; Steer & Cable, 1978; Teece, 1981; Williamson, 1975). For the members of large, complex accounting firms, the idea of a directive, top-down approach to strategic management is not compelling. Equally unconvincing is the idea of clear internal controls circumscribing and channeling the behaviors of local professionals. Much more pertinent is the creation of representative structures that enable the outcomes of strategic processes to be negotiated and collectively agreed upon, combined with systems of market control that seem to confer corporate control but have more form than substance. Our key point is that the P^2-form of organizational structure is understandable within its context, although the form's implications for various aspects of performance have yet to be researched. We surmise that the P^2-form effectively promotes professional satisfaction and commitment and maintains and develops professional standards. It might be less effective, however, in promoting market penetration, client growth, and conventional aspects of financial performance.

Further work is required to better explain the incidence and nuances of

the P^2-form. The intent of this analysis was to describe and explain the strategic management practices of professional partnerships in general. The P^2-form appears to be a configuration of controls relevant to a complex organization of geographically dispersed professionals working within the legal framework of a partnership. One way of testing this assumption would be to conduct research in a number of industries—legal services, for instance—with those characteristics. However, an interesting and potentially enlightening alternative approach would be to examine industries that have only some of the characteristics. For example, many large engineering consulting firms share the task attributes of accounting firms: they are highly professional, geographically dispersed, and geographically differentiated. But their ownership structure is very different. The number of owners is usually very small, and senior practicing engineers are not typically owners. How and to what extent does this difference affect strategic management? Our expectation is that the P^2-form as developed here would not be found in engineering firms. (Nor are we sure that the M-form would be found, which prompts further interest in alternative configurations of strategic management.)

A rather different research site would be the real estate industry. Again, the work is geographically dispersed across local offices and focused on individuals with a portfolio of local clients. The ownership structure, moreover, is close to a partnership arrangement in that local agents own geographical franchises accountable to a national headquarters. But in this case, the nature of the work is much less evidently professional and thus more accessible to central direction. How does this absence of the professional component affect strategic management practices? Again, our expectation is that research would not reveal the P^2-form but something approximating the M-form.

An assumption underlying much work on strategy is that the pattern and structures of strategic arrangements matter. Choice of an M-form, H-form, P^2-form, or other structure is assumed to have an impact on organizational performance. Including measures of performance would enrich any replication of the present research in a related service industry. Organizational performance is admittedly not a simple construct, being neither unidimensional nor necessarily stable over time (Cameron, 1986). In the professional partnerships examined here, for example, we could assess performance in terms of net earnings per partner, billable hours, market sector share, sector penetration, professional autonomy, student recruitment, or partner retention. Moreover, the weighting appropriately given to various performance dimensions can and does change over time. Nevertheless, further examination of the P^2-form would benefit from "unbundling" the performance attributes associated with the form.

Recent developments in the accounting industry suggest a rather different line of future investigation on an issue of broad significance. Accounting firms are struggling to cope with the rapid growth of a demand for management consultancy services at a time when demand for their traditional sta-

ple, accounting and audit services, is growing slowly (*Business Week*, 1988; *The Economist*, 1988). Accountancy firms handle management consultancy in different ways: some firms simply refer such work to an associated firm of management consultants; others have management consultants work with teams of accountants; and yet others have a section or division of management consultants in the firm. Management consultants' views and beliefs about how professional services should be organized differ from those of accountants. The language of management consultants is close to that of corporate managers: the roles of corporate centers, hierarchy, and direction are prominent, and there is sympathy for the relevance of profit centers and the advantages of linking executive performance with compensation. In effect, there are signs of competing "interpretive schemes" within the accounting industry (Ranson, Hinings, & Greenwood, 1980: 4), and strains are beginning to emerge within accounting firms; with its rapid growth, management consultancy threatens to become a cuckoo in the accountants' nest (*New York Times*, 1989).

Future research could explore how far and in what manner accountants can accommodate the emergence of an alternative definition of how to strategically organize and manage professional work. Equally interesting would be to explore how far any professional partnership can coexist with an alternative definition. Is it possible for the P^2-form to embrace different definitions of the roles of a corporate center and its principal business units and the practices that link them, or is the P^2-form appropriate only when an organization is essentially homogeneous?

The range of future research possibilities is broad, given the growth of the services sector in contemporary society. At the very least, we have gone some ways toward redressing the neglect of such organizations in the literature and the present overconcern with strategic practices in manufacturing and related sectors. More broadly, the present study supports the view that generic theories may be misleading. Only close inspection of organizational realities leads to recognizing and understanding patterns of strategic practices.

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STRATEGIC RISK AND CORPORATE PERFORMANCE: AN ANALYSIS OF ALTERNATIVE RISK MEASURES

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This study demonstrates that the various measures of corporate risk strategic management research has used reflect different risk factors. Factor analysis of nine measures of risk yielded three factors: income stream risk, stock returns risk, and strategic risk. The factors were stable over time. Income stream and strategic risk in a given five-year period reduced firm performance in the next five years; however, the strength of the effect varied across industries and between high- and low-performance firms. Contrary to previous cross-sectional work, performance reduced subsequent income stream uncertainty for high performers and increased income stream risk for low performers.

Just as numerous researchers in strategic management have begun to incorporate risk in their research designs,[1] the same authors have begun to call for research on the definition and measurement of risk (Baird & Thomas, 1985). The potential shortcomings of current measures are substantial, but with a few exceptions (e.g., Baird & Thomas, 1985; Beaver, Kettler, & Scholes, 1970; Bildersee, 1975), neither theoretical nor empirical comparisons of risk measures are available. This article reports an initial investigation of the measurement properties of some of the most common measures of risk used in strategic management research.

In addition to examining the measurement properties of risk measures, we sought to demonstrate that differences in measurement influence substantive findings. Previous research on the association between risk and performance has questioned the measurement of risk (Bromiley, in press; Fiegenbaum & Thomas, 1986; Ruefli, 1990). Consequently, although risk has been used in numerous areas of strategic management research, we focused on studies that have considered the direct influences of risk on corporate performance and corporate performance on risk. The results of this compar-

[1] Fiegenbaum and Thomas (1988) summarized such studies.

ison of risk measures is, however, germane to many empirical areas in strategic management. We restricted our view to risk-performance studies to demonstrate the implications of our measurement study for substantive research without being overwhelmed by the many relevant but very different topic areas in which measures of strategic risk have figured.

Studies of the influence of risk on performance have yielded conflicting results. Using variance in returns and content analysis measures, Bowman (1980, 1982, 1984) found a negative association between risk and returns, particularly for below-average performers. Fiegenbaum and Thomas (1985, 1986) found that variance in returns and average returns had associations that varied over time. In their 1986 research, they found no association between the systematic risk of a firm's stock returns—commonly known as beta—and returns measured using accounting data. Fiegenbaum and Thomas (1988), Fiegenbaum (in press), and Jegers (1991) found positive associations between variance in returns and average returns for firms whose returns were above the median in their industry and negative associations for below-median performers. Aaker and Jacobson (1987), using the PIMS data base, found a positive association between performance and both systematic and unsystematic risk when they defined those risk measures using accounting data. The risk-return relation has not had a consistent sign in previous studies.

The use of different risk measures in the cited studies may explain some of their contradictory results. Different measures may, in fact, capture different dimensions of risk. Furthermore, the relations among risk measures and between risk and performance may vary over time.

This study sought to clarify the relations among a variety of risk measures that are relevant to strategic management research and to examine the stability of those relations over time. In this report, we first identify the risk measures that we used and explain their construction.

RISK MEASURES AND DATA

Nine measures of risk that have been used in research relevant to the field of strategic management were identified: systematic risk (beta); unsystematic risk; the debt-to-equity ratio; capital intensity; R&D intensity; the standard deviations of return on assets (ROA), return on equity (ROE), and stock analysts' earnings forecasts; and the coefficient of variation of stock analysts' earnings forecasts.[2] We grouped these variables into three categories: stock returns, financial ratios, and income stream uncertainty.

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[2] Accounting betas, which Aaker and Jacobson (1987) employed, were investigated but not used because the estimates of accounting beta we obtained using quarterly data over the chosen five-year period were extremely unstable and often beyond reasonable values. We would expect betas to cluster in the vicinity of one and range generally from zero to two, but we obtained many estimates over three and substantially below zero.

Measures Based on Stock Returns

Systematic risk and unsystematic risk are standard measures of risk for stock market returns data. In the capital asset pricing model (CAPM) (Lintner, 1965; Sharpe, 1964), systematic risk reflects the sensitivity of the return on a firm's stock to general market movements. Unsystematic risk refers to the extent to which general market movements cannot explain a firm's stock return. Unsystematic risk stems from unique firm or industry characteristics not shared by the market in general.

Aaker and Jacobson (1987) found that both systematic and unsystematic risk, defined with accounting data, influenced performance. Fiegenbaum and Thomas (1986) found that Bowman's (1980, 1982) risk-return paradox, which Bowman demonstrated with accounting data, did not hold if they used beta to measure risk. Numerous studies of stock returns have used beta to control for risk (e.g., Davidson & Worrell, 1988; McGuire, Schneeweis, & Naroff, 1988). Amit and Livnat (1988) included systematic and unsystematic risk among their market measures of risk in an examination of risk-return clusters and corporate diversification.

The regression estimates of beta used here were based on about 1,250 daily observations for each of two approximately five-year periods. The unsystematic risk measure was the standard deviation of the error terms from the equations estimating the betas.

Measures Based on Financial Ratios

Selecting an appropriate set of financial ratios to indicate corporate risk was problematic. As Ben-Zion and Shalit observed,

> The empirical literature in finance often makes little distinction between variables which are *measures* of risk and those which constitute *determinants* of risk. Ideally, one would have liked to possess one set of variables which are theoretically presumed to influence "risk," and another set of variables which are direct measures of "risk," while attempting to explain empirically the latter by the former. Unfortunately, this is not entirely possible at the present state of the arts (1975: 1017).

Since this was an exploratory study of the risk measures encountered in the existing empirical work, it seemed best to err on the side of inclusion rather than exclusion of risk proxies. Consequently, we chose a set of variables that other researchers have argued are related to risk and appeared to us to have the potential to measure risk.

Debt-to-equity ratio. The ratio between debt and equity is a standard measure of corporate financial leverage reflecting a company's risk of bankruptcy (e.g., Hurdle, 1974; Shapiro & Titman, 1986). It is closely related to the ratio of debt to total assets, the leverage measure Amit and Livnat (1988)

employed. In this study, we calculated debt to equity as the ratio of total debt to the sum of common equity and preferred equity.[3]

Capital intensity. Capital intensity, the ratio of capital to sales, increases risk in two ways (cf. Brealey & Myers, 1984; Shapiro & Titman, 1986). If capital inputs are less variable than labor inputs in the short run, a firm choosing to produce a given output with large amounts of capital and low amounts of labor increases its fixed costs and lowers its variable costs. The firm consequently will experience larger variations in profits if demand fluctuates.[4] In addition, a firm using large amounts of capital runs a high risk of capital obsolescence—the possibility that technological change will make its capital investment worth little or nothing.

Empirical studies using capital intensity or a similar measure include Lev (1974) and Hurdle (1974). Hurdle used a heterogeneous sample of large firms studied from 1960 to 1969 and found a positive association between capital intensity, measured as the ratio of capital to sales, and the debt-to-equity ratio. Contrary to industrial economics theory, she found a negative association between capital intensity and variability in returns. Lev examined electric utilities, steel manufacturers, and oil producers from 1957 to 1968. His within-industry analysis indicated that operating leverage (the ratio of fixed costs to variable costs) was positively associated with both systematic and unsystematic risk. In this study, we calculated capital intensity as the ratio of total assets to sales.

R&D intensity. R&D intensity reflects the extent to which a company chooses to develop new processes or products. Investments in R&D face both technological and market uncertainty (Kamien & Schwartz, 1971; Loury, 1979; Scherer, 1967). Technological uncertainty results from decision makers' inability to perfectly foresee the connections between R&D expenditures and the actual introduction of a new product or process. Market uncertainty results from not knowing when actual or potential rivals will introduce innovations that will affect the value of an R&D project at its completion.

Amit and Livnat (1988) clustered firms on the basis of profits and variability of profits and then explained cluster membership by R&D intensity, leverage, and advertising intensity. They found that both leverage and R&D intensity varied significantly across risk-return clusters. Baird (1986) used R&D intensity as a measure of innovation risk, finding that R&D intensity varied significantly across five risk groups in the telecommunications industry. Miller and Friesen (1982) equated subjective measures of risk taking and innovation—but not R&D intensity—and used the two together in defining conservative and entrepreneurial firms. Their subjective measures of

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[3] Common equity is calculated as the closing common share price at the end of the year multiplied by the number of outstanding common shares. Preferred equity is the value of outstanding preferred shares.

[4] For detailed derivations of this point, see Lev (1974) or Percival (1974).

risk taking and innovation correlated at 0.51 ($p < .001$). Here, we calculated R&D intensity as the ratio of R&D expenditures to sales.

Measures Based on Income Stream Uncertainty

Historical returns variability. Along with capital market measures of risk, measures of historical fluctuations in an income stream are among the most common risk measures employed in strategic management research. In addition to the studies by Bowman (1980, 1982) and Fiegenbaum and Thomas (1985, 1986, 1988) mentioned previously, numerous other studies have used variance in returns to measure risk (Armour & Teece, 1978; Bettis, 1981; Bettis & Hall, 1982; Christensen & Montgomery, 1981; Fisher & Hall, 1969; Rumelt, 1974; Woo, 1987). This study included both the standard deviation of ROE and the standard deviation of ROA as proxies for instability of returns.

Measures derived from analysts' forecasts. If a number of individuals forecast the earnings per share for a given corporation, the extent to which they disagree is a reasonable proxy for the uncertainty associated with the firm's future income stream. The Institutional Brokers Estimate System (IBES) reports data that include means and standard deviations of stock analysts' forecasts of earnings per share for companies for a one-year horizon. The number of analysts varies across firms; we dropped observations based on fewer than three analysts' forecasts from the data.

Two risk measures were derived from these data. The first one is the standard deviation of the earnings-per-share forecasts. Applications of this measure appear in Bromiley (1991), Conroy and Harris (1987), and Imhoff and Lobo (1987, 1988). We used the average of the standard deviations reported for January, February, March, and April of a given year. The second measure is the standard deviation normalized by the mean estimate, or coefficient of variation, which several investigators have also used as a measure of uncertainty (e.g., Brown, Richardson, & Schwager, 1987; Pari & Chen, 1985).

Data

All companies in COMPUSTAT's primary, secondary, and tertiary files for which matching data could be found in IBES were included in the analysis. Consequently, the firms studied were generally large and included companies from the single-digit Standard Industrial Classification (SIC) code industries zero through eight. We used daily stock price data from the Center for Research on Stock Prices (CRSP) for calculating beta and unsystematic risk. The data set was divided into two five-year time periods (1978–82 and 1983–87) to test the stability of the risk factors over time. This partitioning also facilitated assessment of the influence of risk on subsequent performance and the effect of performance on subsequent firm risk.

An analysis of the distributions of the risk and performance measures indicated that these data included some extreme outlier values. We elimi-

nated outliers in the annual data by deleting the observations with values in the bottom or top 2 percent of each variable's distribution. In the case of the unsystematic risk variable, however, we deleted only observations in the top two percentiles.

For the first period, data on the nine risk variables were from 526 firms. For the second period, data were from 746 firms. A total of 493 firms appeared in both time periods. We calculated the standard deviations of annual ROE and ROA for each company in each period. As noted above, we estimated beta and unsystematic risk from a conventional market model regression equation using daily data. All other variable values were calculated as the means for each time period.

FACTOR ANALYSIS METHODS AND RESULTS

The factor analysis consisted of three stages. We first conducted an exploratory analysis of the period one data and then used the same procedures on the period two data. Next, we examined the congruence between the factor structures for the two periods. Table 1 provides the correlation matrix for the two sets of risk measures.

Estimation of the orthogonal factor model on the period one data indicated three eigenvalues greater than one. For estimation, we used the SAS factor analysis procedure (SAS, 1985). The top half of Table 2 shows the principal component factor solution with varimax rotation for period one. Factors with eigenvalues greater than one were retained for rotation, and the reported variance explained is for the rotated factor pattern. Following Johnson and Wichern (1988), we also estimated the factor structure using a maximum likelihood procedure. Those results, as well as those using an oblique rotation, were very similar to the pattern of factor loadings presented here.

TABLE 1
Correlations Among Variables[a]

Variables	1	2	3	4	5	6	7	8	9
1. s.d., ROA		.80	.36	.37	.40	.32	−.04	−.17	.20
2. s.d., ROE	.83		.45	.34	.33	.26	.18	.03	.10
3. s.d., forecasts	.47	.48		.55	.20	.05	.18	.02	.01
4. Coefficient of variation, forecasts	.55	.57	.69		.33	.26	.11	.03	−.01
5. Beta	.24	.31	.09	.23		.60	.07	−.14	.21
6. Unsystematic risk	.23	.33	−.01	.23	.66		.11	−.08	.02
7. Debt-to-equity ratio	−.11	.18	.13	.16	.05	.19		.29	−.29
8. Capital intensity	−.29	−.00	−.01	−.05	−.14	−.14	.35		−.22
9. R&D intensity	.13	.03	−.07	−.03	.23	.06	−.32	−.24	

[a] Correlations for period one (1978−82) appear below the diagonal, and those for period two (1983−87) appear above it. Correlations with absolute values over .09 are statistically significant (p < .05) for period one (N = 526). For period two (N = 746), the critical value (p < .05) is .07.

TABLE 2
Rotated Factor Patterns[a]

Variables	Factor One: Income Stream Risk	Factor Two: Stock Returns Risk	Factor Three: Strategic Risk	Communalities
Period one, 1978–82				
s.d., ROA	0.824	0.169	−0.309	0.803
s.d., ROE	0.819	0.301	0.029	0.762
s.d., forecasts	0.823	−0.130	0.112	0.707
Coefficient of variation, forecasts	0.838	0.127	0.087	0.726
Beta	0.137	0.862	−0.140	0.781
Unsystematic risk	0.110	0.905	0.025	0.832
Debt-to-equity ratio	0.099	0.257	0.791	0.702
Capital intensity	−0.101	−0.108	0.719	0.539
R&D intensity	−0.039	0.195	−0.664	0.480
Variance explained	2.782	1.830	1.720	
Proportion	0.309	0.203	0.191	
Cumulative	0.309	0.512	0.703	
Period two, 1983–87				
s.d., ROA	0.754	0.299	−0.287	0.741
s.d., ROE	0.811	0.219	−0.023	0.707
s.d., forecasts	0.807	−0.095	0.123	0.676
Coefficient of variation, forecasts	0.673	0.192	0.120	0.504
Beta	0.267	0.819	−0.124	0.758
Unsystematic risk	0.095	0.904	0.040	0.828
Debt-to-equity ratio	0.156	0.167	0.749	0.613
Capital intensity	0.025	−0.141	0.672	0.472
R&D intensity	0.111	0.067	−0.696	0.501
Variance explained	2.450	1.724	1.626	
Proportion	0.272	0.192	0.181	
Cumulative	0.272	0.464	0.645	

[a] Bold print highlights the factor loadings with absolute values greater than .40.

The standard deviations of ROA and ROE and the two measures based on variation in stock analysts' forecasts of earnings per share have large positive loadings on the first factor. We termed this factor *income stream risk*.

The second factor, consisting of systematic and unsystematic risk, we termed *stock returns risk*.

The third factor, which loads positively on the debt-to-equity ratio and capital intensity and negatively on R&D intensity, captures some key corporate strategy variables affecting firm risk and was labeled *strategic risk* or *industry risk*. This factor reflects the finding, evident in the correlation matrix in Table 1, that high debt-to-equity ratios and capital intensity are associated with levels of R&D expenditures that are low relative to sales. Since leverage, capital intensity, and R&D intensity vary substantially and system-

atically across industries, it is possible that part of what this factor is picking up is industry-specific risk.

The bottom half of Table 2 reports the results from the principal components factor analysis with varimax rotation for the period two data. As with the period one data, we used both maximum likelihood factor analysis and an oblique rotation factor solution to check the consistency of the factor-loading pattern across alternative methods. The results from the various techniques agree with the varimax-rotated principal components results presented here.

Direct examination of the factor loadings indicates substantial agreement between the factor structures for the two periods. The coefficients of congruence between the two structures are quite high for all three factors;[5] the congruences between periods one and two for factors one to three are 0.985, 0.984, and 0.997. Thus, we concluded that the factors identified were stable over the two time periods.

INTERPRETING THE RISK FACTORS

Several authors (Fiegenbaum & Thomas, 1988; Jemison, 1987; Oxelheim & Wihlborg, 1987) have suggested that different stakeholders may be interested in different measures of corporate risk. The labels attached to the three risk factors we identified are consistent with the notion that the relevance of a risk measure differs across stakeholder groups (Freeman, 1984).

Factor one, income stream risk, is generally believed to be the measure of risk most relevant to general managements (Fiegenbaum & Thomas, 1988; Libby & Fishburn, 1977). Profits make it easier for general managers to satisfy the costly needs of diverse stakeholder groups. Reductions in profits result in numerous, usually unpleasant, managerial actions, such as layoffs, reductions in capital investment, and increases in cost control (Bromiley, 1986). In addition, stable, adequate profits facilitate implementation of corporate strategies. Alternatively, if managers are likely to be fired when profits fall rapidly, income stream stability should increase the stability of employment for a company's managers and other employees.

Factor two, stock returns risk, captures risk from the perspective of stockholders. As implemented in this study, stock returns risk measures variability in historical stock returns. According to the assumptions of the CAPM, investors can eliminate unsystematic risk through portfolio diversification. Nevertheless, stockholders with poorly diversified portfolios may value reductions in both systematic and unsystematic risk. In addition, if managers tend to be fired following substantial reductions in stock returns, risk-averse managers will demand a premium to work for firms with high

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[5] As with a correlation coefficient, coefficients of congruence for comparing factor structures can take values from minus one to plus one, corresponding to perfect inverse agreement and perfect agreement, respectively (Harman, 1976: 344). A value of zero indicates there is no similarity between two factors.

unsystematic risk, and in general, firms with high unsystematic risk will have lower-quality managers than other firms (Aaker & Jacobson, 1987). If that is true, stockholders may value reductions in unsystematic risk because they allow a firm to attract better managers and thus improve performance.

Factor three, strategic risk, has risk implications for multiple external stakeholder groups. Its high loadings with opposite signs on R&D intensity and capital intensity indicate contrasting strategic postures in the choice of a firm's technology. A capital-intensive firm may have lower average costs than a more labor-intensive competitor, but a company investing heavily in R&D may exhibit greater dynamic efficiency, or more flexibility than its competitors in adapting to changes in input prices and technology. Such risk trade-offs seem to be central considerations in determining a firm's strategy. The high loading on the debt-to-equity ratio in the strategic risk factor implies that it may also be relevant to creditors.

Chakravarthy (1986) argued that considering diverse stakeholder perspectives is critical to developing valid measures of strategic performance. Our factor analysis results suggest that implicit stakeholder perspectives may underlie investigators' choices of risk measures as well.

A stakeholder interpretation of our risk factors should, however, be tempered by recognizing that we can at least partially explain the factor structure as an artifact of the construction of our risk measures. For example, the standard deviation of analysts' forecasts and the coefficient of variation are likely to be positively correlated since the latter is simply equal to the standard deviation of analysts' forecasts normalized by the mean forecast. Similarly, ROA and ROE share a common numerator. The possibility that the factor structure found is an artifact of variable construction is not, however, incompatible with the stakeholder perspective. For example, even though the standard deviations of ROA and ROE fall into the same factor at least partially because they are both constructed using income, income stability is still important to certain stakeholders. To say that the data source and manner of the variables' construction influence the associations among them is not to say that the variables and their associations do not relate in important ways to other frameworks and modes of interpretation.

RELATIONS BETWEEN RISK AND PERFORMANCE

Given the risk factors identified above, we next examined how performance influenced the three types of risk and how the latter influenced performance. In examining those relations, we used measures taken in period one to explain risk and performance in period two, a procedure that gave us greater confidence that we could assign causality than we would have had with a cross-sectional analysis. Using the risk measures developed above, we estimated (1) the influence of risk on subsequent performance and the stability of that influence across industries and performance levels and (2) the influence of performance on subsequent risk and the stability of that influence across performance levels.

The Influence of Risk on Performance

The different components of risk were measured by the factor scores obtained from the period one (1978–82) principal components factor analysis. The dependent variables, ROE and ROA, measured performance in 1983–87. Each observation consisted of factor scores for a given firm in period one and the firm's performance measures in both periods. Using data from the 493 firms that figured in both time periods, we estimated the following model:

$$Performance_t = b_0 + b_1 \text{ Income stream risk}_{t-1} + b_2 \text{ Stock returns risk}_{t-1} + b_3 \text{ Strategic risk}_{t-1} + b_4 \text{ Performance}_{t-1} + e_t. \qquad (1)$$

The role of the lagged dependent variable in Equation 1 deserves some comment. If there are relatively stable factors that influence a firm's returns, such as size or degree of diversification, such factors should influence returns in both periods studied. Including period one performance controlled for any such omitted firm-specific factors.

The following sections present hypotheses predicting the signs of the parameters in Equation 1. Since no previous research has employed multidimensional risk constructs in this fashion, the interaction among the independent propositions is unclear.

Income stream uncertainty. Our analysis of the influence of income stream uncertainty on performance drew on three different approaches. Advocates of *prospect theory* view changes in risk as directly reflecting managers' choices about risk and return. Proponents of the *default risk perspective* have argued that performance variability increases the likelihood a firm will default on either implicit or explicit commitments, which results in increased costs, decreased revenues, or both. According to the *adjustment costs position*, changes in output and performance per se impose costs on a firm through operational inefficiencies. Each of these three perspectives leads to specific hypotheses about the influence of income stream risk on firm performance.

Previous research on risk and return has frequently used prospect theory (Kahneman & Tversky, 1979) to explain risk-return relations (Bowman, 1980, 1982, 1984; Fiegenbaum, in press; Fiegenbaum & Thomas, 1985, 1986, 1988). Let us assume a company has a target performance level that corresponds to the mean performance for its industry[6] and that a pool of projects exists from which managers choose the projects they will undertake. The managers evaluate the projects on the basis of the expected risk and return

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[6] Fiegenbaum and Thomas (1988) and Fiegenbaum (in press) used median industry performance as a target level. Both the median and the mean appear to be reasonable proxies for the target performance level within an industry.

each would add to the company's overall position.[7] Managers examine the risk-return position of their corporation under the assumption that the company will take on one of the projects and thus make a choice with respect to overall corporate risk and return.

According to prospect theory, a firm with performance above the average for its industry should be risk-averse and only willing to accept an increase in income stream risk if an investment opportunity offers high expected returns. The better the performance of a firm, the less willing it is to take on additional risk in order to increase its expected returns. Thus, when a high-performing firm does assume risk, it is a risk that promises high returns. Consequently, for firms with above-average performance, increases in risk will increase subsequent performance.

Under prospect theory's assumptions, low-performing firms will forego expected returns to increase variance in returns, and the rate at which they make that trade-off increases as performance declines. The choice of high-variance projects increases the probability of obtaining a target level of performance for below-target firms (Singh, 1986). Thus, the lower a firm's performance, the more likely it is to choose a risky project with low expected returns over a less risky project with higher expected returns. Consequently, for low-performing firms, risk should be associated with having given up returns to obtain increased risk, which implies that for firms with below-average performance, increases in risk will decrease subsequent performance.

Shapiro and Titman (1986) and Cornell and Shapiro (1987) argued that variability in performance increases a firm's default risk. High variability in performance increases the likelihood that a firm will default on either its explicit commitments, such as contractual arrangements with suppliers, buyers, and the like, or its implicit commitments—such as mutual understandings with or promises to buyers, employees, and customers. For example, if a buyer perceives that a firm may have to default on its explicit warranty commitments or its implicit commitment to maintain the availability of parts and service, the buyer will tend not to buy from the firm. Similar arguments can be made concerning suppliers and employees. Highly variable returns may both lower a company's sales and raise its direct costs because the parties dealing with it may require a monetary advantage to induce them into a transaction. Income variability influences implicit contracts even if bankruptcy is unlikely since firms under financial pressure may take moves (e.g., selling a division) that negate implicit contracts well before bankruptcy occurs.

Even if suppliers, buyers, and employees are not concerned about a firm's defaulting on explicit or implicit claims, problems with adjustment costs suggest that performance variability is costly. Changes in production

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[7] If we assumed that managers evaluate projects strictly on the basis of the projects' own risk-return characteristics, it would not be clear how to factor a company's current position into the choice.

levels present direct costs incurred in hiring, training, and laying off workers. High variability in sales makes efficient utilization of capital difficult and may force a firm to maintain high levels of inventory. Workers and suppliers will both demand premiums to compensate for the problems of varying employment or purchasing levels. Thus, the frictions associated with adjusting a company's activity levels provide another basis for arguing that performance variability negatively affects performance.

Although the three arguments presented lead to substantially similar predictions, they do differ. According to the default risk argument, risk should have a larger negative influence on performance for low-performance corporations than for high-performance corporations since the likelihood that returns variability will result in the abrogation of contracts should be higher for the former. According to the adjustment costs argument, the negative influence of income stream variability on performance should be constant across performance levels since performance should not influence the direct costs imposed by adjusting production and output. Finally, according to the prospect theory argument, income stream variability will reduce performance for poor performers but increase it for high performers. In another study, Bromiley (1991) found that income stream risk negatively influenced subsequent performance irrespective of a corporation's performance level.

Stock returns risk. If firms use the CAPM to select investment projects, we would expect a positive association between beta and performance. Under value-based planning, or CAPM investment rules, the value of a given investment is the net present value of the income streams associated with it, which can be expressed by the following model:

$$\text{Net present value} = \sum_{t=0}^{t=T} (R_t - C_t)/(1+r)^t,$$

where R_t and C_t are the levels of revenue and costs in period t, T is the relevant time horizon for a project, and r is the project-specific discount factor, a positive function of the market's risk premium and the project's beta. Cash inflows include both assets and operating subsidies, and cash outflows are net funds from operations. Almost all investments start with one or more years of negative net cash flows, while capital investment occurs and sales have not started, and end with a series of positive net cash flows.

If a corporation uses its corporate beta for capital budgeting, an increase in that beta will make short-term cash flows more important than later cash flows in calculating the expected net present value of a project. Since immediate cash flows tend to be negative, the increased beta reduces the net present value of the investment. Thus, a firm with a low beta—which implies a low cost of capital—can better afford to invest in projects with low returns than a firm with a high beta.[8]

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[8] This relationship underlies much of the public policy debate about differences in the costs of capital in the United States and Japan (Hatsopoulos, 1983).

This argument implies that firms for which capital is costly can only afford to invest in projects yielding high returns on the assets required. If a company is following shareholder value, or net present value, procedures in making investment decisions, increases in beta will be associated with subsequent positive changes in returns on investment.

On the other hand, stock returns risk includes both beta (systematic risk) and unsystematic risk. In the CAPM, unsystematic risk plays no role in influencing investment decisions and so should have no influence on performance. Consequently, stock returns risk should have either a positive or neutral influence on subsequent performance.

Strategic risk. The dynamic effects of strategic risk on performance are not clear. If firms have optimal capital structures, then capital structure should not explain profitability differences across firms. Finance theory often assumes that existing capital structures are optimal and need therefore to be explained as the result of optimizing behavior. Likewise, if firms are being sensible about capital and R&D intensity, they should invest to the point at which marginal cost is equal to marginal revenue. Therefore, it seemed unlikely that we would find an association between those variables and performance.

On the other hand, Jensen (1989) argued that managers in highly leveraged firms must operate more efficiently than the managers of other firms, which implies that the ratio of debt to equity positively influences performance. Further research on R&D has suggested that R&D intensity positively influences performance (Ravenscraft & Scherer, 1982). Given our strategic risk factor's opposite loadings on debt to equity and R&D intensity and the variety of theoretical arguments available, we formed no overall hypothesis concerning the influence of strategic risk on corporate performance.

Results. We examined three sets of estimates of the influence of risk on performance. First, we analyzed an aggregate set of estimates, since many of the hypotheses were not differentiated by performance level. Second, we estimated the model separately for high- and low-performing companies. Third, to test the robustness of the results, we estimated separate models for different industries.

Using the aggregate data and least-squares procedures, we obtained the results shown in Table 3. Since the substantive results of the ROA and ROE regression equations agree, we discuss those results together. Although the significance of the lagged dependent variable (ROE and ROA in period one) indicates significant serial correlation, the similarity between the R^2s computed with and without the lagged dependent variable indicates that the risk factors explain a significant portion of the variance in returns. Furthermore, the signs and general magnitudes of the parameter estimates on the risk factors did not change when we removed lagged performance from the equation. Although lagged performance has a significant influence on performance, the risk factors also appear to have a substantial influence.

Our finding that income stream risk has a significant negative influence on performance is consistent with Bowman's (1980, 1982) risk-return para-

TABLE 3
Results of Aggregate Regression Analysis[a]

Variables	ROE, Period Two	ROE, Period Two	ROA, Period Two	ROA, Period Two
Intercept	0.068***	0.101***	0.015***	0.047***
	(0.010)	(0.003)	(0.003)	(0.002)
ROE, period one	0.251***			
	(0.070)			
ROA, period one			0.503***	
			(0.048)	
Income stream risk	−0.025***	−0.032***	−0.008***	−0.015***
	(0.004)	(0.004)	(0.002)	(0.002)
Stock returns risk	0.002	0.004	0.000	0.001
	(0.004)	(0.004)	(0.002)	(0.002)
Strategic risk	−0.007†	−0.012***	−0.005**	−0.017***
	(0.004)	(0.004)	(0.002)	(0.002)
R^2	0.167	0.145	0.402	0.269
F	24.403***	27.537***	82.120***	60.015***

[a] Standard errors appear in parentheses. $N = 493$.
    † $p < .10$
    * $p < .05$
    ** $p < .01$
    *** $p < .001$

dox. Although the negative association between risk and performance was not surprising, this analysis did extend Bowman's results in an interesting way. In a study of 26 companies, Bowman (1984) found that low performance increased risk taking but not that risk influenced future performance, a relation that our results strongly indicate.

Although stock returns risk has positive parameter estimates in all the regression equations calculated here, all the estimates are statistically insignificant. That insignificance does not lend strong support to our predictions but is consistent with our theoretical discussion suggesting a positive influence for beta and a zero influence for unsystematic risk.

For unclear reasons, strategic risk has significant, negative parameter estimates in all equations. If the parameters were an artifact of the data construction, the signs would be the opposites of those found. For example, the ratio of debt to equity and ROE both have equity in the denominator, which would suggest a positive association between the two, not the negative association that occurs. Although it makes sense that optimal levels of debt to equity, capital intensity, and R&D intensity exist within an industry, it is difficult to accept that such a level has validity across industries. The simple interpretation that firms use excessive capital and debt and insufficient R&D is troublesome because it suggests general errors in capital structure, capital intensity, and R&D expenditures. Most economic and financial models assume such errors do not exist.

In discussing the regression results, it may be that the relations found

are not causal since industry risk factors might reflect omitted variables that could explain the results. For example, perhaps sectors of the economy with low capital intensity, high equity, and high R&D intensity improved their performance during 1983–87 more than other sectors of the economy. Further research is needed to explore this possibility.

The prospect theory analysis suggests that the influence of income stream risk on performance should vary across performance levels. We divided the corporations studied into those above and those below the mean performance level for their single-digit SIC code industry in 1978–82 and then estimated the performance equation separately for high and low performers. A lack of representative firms required combining industries zero and one into one category and seven and eight into another. Since no firm from SIC code nine appeared in both five-year time periods, the industry classification included seven distinct categories.[9] Table 4 presents the results of this analysis.

In all four regression equations, income stream risk has negative, statistically significant coefficients. In the two equations in which strategic risk has significant coefficients, the coefficients are negative. Stock returns risk has insignificant coefficients in all four regressions. We were able to reject the hypothesis that all the parameters were equal for the high and low performers. Tests for such equality yielded a value for $F_{5,482}$ of 8.67 for the ROE equation and of 12.54 for the ROA equation ($p < .001$). Examination of the coefficients indicated large differences in intercepts and in the effects of past performance.

These findings support the position that by imposing costs or decreasing revenues, risk reduces performance. We did not find support for the prospect theory argument that the signs of the parameters on income stream uncertainty differ for high and low performers. Instead, income stream risk has negative and significant parameters in all four estimates. Likewise, we found no support for the default risk argument. The influence of risk on performance is not greater when performance is low; for ROE, the parameters are almost identical ($-.031$ and $-.033$), and for ROA the parameter for low performers is smaller than that for high performers ($-.009$ and $-.023$).

Although the aggregate results appear quite strong, they do not provide evidence that the patterns can be applied in any specific industry. That is, a strong pattern in some industries might hide a lack of association in other industries. Results of the test for equality of regression coefficients across industries indicated that significant differences existed ($F_{30,457} = 3.34$ for ROE and 3.67 for ROA, $p < .01$). Examination of the coefficients indicated

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[9] The number of companies in each single-digit SIC industry group was as follows: agricultural production, mining, and construction (SIC 0 and 1): 22; food products, tobacco, textiles and apparel, lumber and wood products, paper, chemicals, and petroleum (SIC 2): 128; rubber, leather, glass, concrete, metals, machinery, and other manufacturing (SIC 3): 139; transportation, communication, and utilities (SIC 4): 105; wholesale and retail trade (SIC 5): 31; financial industries (SIC 6): 42; and services (SIC 7 and 8): 26.

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TABLE 4
Results of Regression Analysis by Performance Level[a]

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Independent Variables	ROE, Period Two		ROA, Period Two	
	High Performers	Low Performers	High Performers	Low Performers
Intercept	−0.020	0.111***	−0.024**	0.033***
	(0.024)	(0.014)	(0.007)	(0.004)
ROE, period one	0.724***	−0.198		
	(0.132)	(0.129)		
ROA, period one			0.841***	0.175*
			(0.079)	(0.087)
Income stream risk	−0.031***	−0.033***	−0.023***	−0.009***
	(0.007)	(0.005)	(0.004)	(0.002)
Stock returns risk	−0.009	0.007	−0.004	0.001
	(0.006)	(0.004)	(0.003)	(0.002)
Strategic risk	−0.017**	−0.000	0.003	−0.010***
	(0.006)	(0.005)	(0.004)	(0.002)
R^2	0.223	0.174	0.509	0.226
F	17.303***	12.732***	50.693***	20.906***
N	246	247	201	292

[a] Standard errors appear in parentheses.
 † $p < .10$
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

that income stream uncertainty generally had a negative influence on subsequent performance. It was statistically significant ($p < .10$) in five of the seven ROE equations and three of the seven ROA equations. The influence of the other factors, which varied substantially, was generally statistically insignificant. Thus, we concluded that the influences of stock returns and strategic risk on performance differ across industries but that income stream uncertainty appears to have a broad negative influence on performance.

The Influence of Performance on Risk

Having examined the influence of risk on performance, we turned to the symmetric question—the influence of performance on risk. In evaluating this question, we used the following model:

$$Risk_t = c_0 + c_1 \, Performance_{t-1} + c_2 \, Risk_{t-1} + e_t. \tag{2}$$

Income stream uncertainty. According to the prospect theory logic presented above, a firm with performance above its industry average will be risk-averse, and risk aversion will increase as performance increases. Consequently, the higher its past performance, the less risk a firm will assume. For firms with above-average performance, increases in performance reduce subsequent levels of risk.

For firms that are below target, prospect theory suggests that low performance results in seeking projects with higher risk. Thus, the lower the

firm's performance, the higher the subsequent risk. In other words, for firms with below-average performance, increases in performance reduce subsequent levels of risk.

Taken together, the analyses for high and low performers imply that performance reduces risk for all firms.

Stock returns risk. We expected that performance would have a negative, indirect influence on stock returns risk. Stock prices vary with fluctuations in actual performance. Indeed, some authors have argued that variability in stock prices is substantially greater than can be explained by variability in corporate cash flows (e.g., Shiller, 1981, 1986). If variability in stock returns is associated positively with variability in returns, and variability in returns is negatively associated with the level of previous returns, there is likely to be a negative association between the level of returns and subsequent stock returns risk.

Strategic risk. We expected high performance would reduce strategic risk. If a firm does not consciously increase its debt or dividends, increases in profits add to retained earnings and stockholder equity, which reduces the debt-to-equity ratio. Alternatively, losses reduce retained earnings and stockholders' equity and increase debt to equity. Since improvements in performance increase slack resources, performance and subsequent R&D intensity should have a positive relationship. A negative relationship between performance and the strategic risk factor, which loads negatively on R&D intensity, is thus likely. The influence of performance on capital intensity is too complex to capture in a simple hypothesis. The designers of most investment models have assumed that firms attempt to reach a target level of capital intensity. The influence of performance per se on adjustments in capital intensity should depend on the direction of change in output, the liquidity position of a firm, and a number of other factors (Bromiley, 1986).

Results. We estimated regression equations for each of the three risk measures using both ROA and ROE. Each of the six estimations used the entire set of 493 observations. In only one of these models was the coefficient on lagged performance significant at the 0.10 level. Thus, these results do not indicate a significant association between performance and subsequent firm risk in the data combining high- and low-performing firms.

Although we hypothesized that performance would have the same influence on income stream uncertainty for high and low performers, that assumption required testing, since many previous researchers have found that risk-return associations differ across performance levels. We divided the firms into those above and those below the mean performance level for their industry in 1978–82, using ROA in period one to assign firms to performance categories in the equations with ROA as an independent variable and ROE in the ROE equations. The model was estimated for each of the three risk factors. Table 5 reports the coefficient on period one performance (c_1 in Equation 2), its statistical significance, and the values for R^2 and F for each of the 12 regression equations resulting from crossing the three risk factors with the two performance measures and two performance levels.

TABLE 5
The Influence of Performance on Risk[a]

Independent Variables	N	Income Stream Risk			Stock Returns Risk			Strategic Risk		
		c_1	R^2	F	c_1	R^2	F	c_1	R^2	F
ROA										
High performers	201	-2.846†	0.305	43.4	0.395	0.516	105.5	0.903	0.823	459.0
Low performers	292	1.786	0.375	86.7	-1.669	0.689	319.7	-2.782*	0.852	830.4
ROE										
High performers	246	-2.469*	0.264	43.7	1.155	0.586	171.8	-0.258	0.852	699.0
Low performers	247	4.161**	0.427	90.7	-2.728***	0.691	273.2	-2.304***	0.863	770.1

[a] Entries are the coefficient estimates for the performance variable, c_1 in Equation 2. All F statistics reported are statistically significant ($p <$ .001).

† $p <$ .10
* $p <$ .05
** $p <$ .01
*** $p <$ .001

The results reported in Table 5 indicate that the influence of performance on income stream risk differs substantially across performance levels. Rather than the consistently negative parameters hypothesized, we obtained negative parameters for high performers and positive parameters for low performers.

Performance had a statistically significant influence on stock returns risk only for firms with a low ROE, and that influence was negative. Rather than the consistently negative parameters hypothesized, we obtained statistically significant negative parameter estimates for the influence of performance on strategic risk for low performers and insignificant parameter estimates for high performers.

Although the aggregate regression equations indicated that performance had no influence on risk, dividing the data by performance level substantially changed the results. The most interesting result from the split data analysis is that performance appears to reduce subsequent income stream uncertainty for high performers but increase it for low performers, at least when ROE is the measure. This finding is not consistent with previous cross-sectional research (Fiegenbaum, in press; Fiegenbaum & Thomas, 1988), nor with our interpretation of prospect theory.

CONCLUSIONS

This study yielded a number of findings regarding the existence of differing risk factors, their influence on performance, and the influence of performance on risk.

Risk Factors

The factor analysis results suggest that several distinct empirical risk factors exist and are stable over time. The factors identified were income stream uncertainty, stock returns risk, and strategic, or industry, risk. Although other sets of candidate variables may give slightly different factors, the analysis strongly supported our contention that risk measures differ substantially.

The three risk factors have substantial face validity. Factor one clearly fits the income stream uncertainty concept, with high loadings on the standard deviations of ROA, ROE, analysts' forecasts, and the coefficient of variation of analysts' forecasts. The two measures based on analysts' forecasts are ex ante proxies for income stream uncertainty. Factor two includes both stock market variables measured. Factor three includes all three accounting ratios used: debt to equity, capital intensity, and (with a contrasting sign) R&D intensity. Reasonable explanations are readily available for these groupings.

In addition to demonstrating the existence of different dimensions of risk, the factor analysis results indicate that several of the original variables are reasonable indicators of the underlying risk factors. In the orthogonal factor model, factor loadings can be interpreted as the correlations between the observed measures and the common factors (Johnson & Wichern, 1988).

The factor loadings (Table 2) indicate that all four variables measuring income stream uncertainty correlate highly ($r > .67$) with the underlying factor, and the standard deviations of ROE and of analysts' forecasts have correlations over .80 with the factor in both time periods. Similarly, the correlations of beta and unsystematic risk with the stock returns factor are over .81. The three strategic or industry risk variables have correlations with the third factor over .66. The ratio of debt to equity appears to have the highest correlation with the third factor (r's $= .791$ and $.749$). These high correlations suggest that some of the original variables can serve as reasonable proxies for the underlying risk factors.

The Influence of Risk on Performance

The results demonstrate that income stream risk reduces subsequent performance and that this influence exists across industries and performance levels. On the other hand, the influence of strategic risk on performance varies across industries and performance levels. Additional work on strategic risk, particularly the connections among financial strategies, operational strategies, and performance, appears to be needed. We found no evidence that stock returns risk influenced performance. Rather than supporting a prospect theory view that the influence of risk on performance varies across performance classes, these results are consistent with the view that income stream variability creates costs or reduces revenues for a company. The results of the regression equations calculated for performance here demonstrate that studies using different measures of risk will get different results.

The Influence of Performance on Risk

Contrary to our interpretation of prospect theory, the influence of performance on income stream risk varies across performance levels. For high performers, performance reduces subsequent income stream risk, but for low performers, it increases income stream risk. Little evidence that performance influences stock market risk emerged. Performance appears to reduce strategic risk for low-performing companies.

Our estimates suggest a peaked relation between performance and subsequent income stream risk: high and low levels of performance result in low levels of income stream risk, and moderate performance levels result in high levels of risk. These results, which certainly do not fit our interpretation of prospect theory, pose a puzzle for further theory development. Applications of prospect theory to time series models depend critically on assumptions about firms' pools of available projects and whether projects are evaluated in isolation or in terms of their contribution to overall corporate risk and return. The present results may be explicable with prospect theory if different assumptions were used.

In addition to developing multidimensional risk measures, this study made another methodological contribution. Although the cross-sectional work of previous authors makes sense within the theories they have tested,

longitudinal studies allow tests of the direction of causality, a dimension absent in cross-sectional work. Bowman's (1982) statement about "risk-seeking by troubled firms" clearly implied that performance drives risk. The multiple time periods approach used here allowed us to test such models, and the results demonstrated that such testing can yield significant results. It is impressive to us that models based on five-year averages can have significant results when one five-year period explains a subsequent five-year period.

In summary, this study evaluated the measurement properties of some of the most common risk proxies used in strategic management research. We applied the three underlying risk factors derived from this analysis to the study of risk-return relations in corporate data, demonstrating that differing risk factors provide different substantive results. The results indicate that income stream risk has a negative influence on subsequent performance. Other findings from the application were not readily explicable with the theory developed here and merit further study. These results can be seen as a prelude to more detailed and sophisticated tests of the causal mechanisms and logics presented for risk-return relations.

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EXCESS RESOURCES, UTILIZATION COSTS, AND MODE OF ENTRY

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This study integrates the concepts of utilization costs, resource-based theories, and capital market imperfections into a new framework to explain how companies choose to enter new markets. Two modes of entry are considered: direct entry and acquisition. Factors are identified that help entrant firms choose the mode of entry that will minimize the cost of utilizing their excess resources in new markets. Employing current capital market theory and the assumption that information is asymmetric between firms and the capital market, the study demonstrated that utilization costs will differ for different types of resources for the two modes of entry. Good support for the theoretical predictions emerged from a model tested on 144 diversification moves.

Stories about mergers and acquisitions capture the attention of the business press, yet very little has been written about why some firms choose to diversify via mergers and others enter markets directly. Some studies have looked at fairly specific aspects of decisions about these two modes of entry (Berg, 1973; Lamont & Anderson, 1985; Levitt, 1975; Pitts, 1980; Song, 1982). However, only Yip (1982) developed a comprehensive model to investigate ex ante determinants of these two modes of entry. By considering the cost of entry and the relatedness of an entrant to an entered market, Yip found evidence to suggest that the choice between the two modes is not indifferent, stating that "relatedness which reduces barriers has an asymmetric impact [on the cost of entry] under the two modes of entry" (1982: 333). Specifically, Yip predicted and found indirect evidence that the more similar an entrant to the existing firms in a market, the higher is the likelihood that the entrant will choose direct entry.

Yip's model is interesting because it is the first in which the underlying concepts of strategic management are applied to a traditional economic topic. In the current study, I extended Yip's efforts by introducing the con-

cept of utilization costs, the costs of using excess resources. This approach, which allows consideration of the costs of using different types of resources in any new market, is generalizable across all types of entrants.

THEORETICAL DEVELOPMENT

Entry barriers are resources that the incumbents in an industry possess but that an entrant has to obtain at a cost. Examples include brand names, distribution channels, technical skills, and patents. Under the standard microeconomics assumption of perfectly divisible and marketable resources, entrant firms do not have any excess resources from their current operations, so in order to compete in a new market, an entrant will have to develop or acquire all needed resources. The entrant will bear the full entry cost irrespective of its mode of entry. However, the entrant will not earn any above-normal returns from the diversification attempt because the market ascribes a fair value to these resources that is based on their future profit potential.

Penrose (1959), the first analyst to relax the assumption about divisibility, developed a theory of firm diversification based on efficiencies generated from using excess resources in more than one market. Similar resource-based themes have appeared in organization theory (Burt, 1983; Pfeffer & Salancik, 1978), institutional economics (Teece, 1982), and industrial organization economics (Carleton, Harris, & Stewart, 1984; Caves, 1982; Gorecki, 1975; Lecraw, 1984; Lemelin, 1982; Macdonald, 1985). Collectively, these studies have concluded that firms tend to diversify into industries that use resources already used in their present industries. However, in all but the most extreme cases, diversifying firms need to obtain other resources that complement their existing resources before an entry is feasible. For example, a company may have the manufacturing and distribution capabilities needed to enter a market but lack brand recognition. The cost of obtaining brand recognition represents that entrant's utilization cost, or the cost it must incur before it can successfully apply excess resources to the new market. For most entrants, however, reducing operating costs from transferable excess resources can offset part of the cost of acquiring complementary resources. Thus, the following is a general formulation of utilization costs: Utilization Costs = Costs of Acquiring Complementary Resources − Reduction in Operating Costs from Transferable Excess Resources.

Utilization costs represent only the entry costs relevant to a particular situation, whereas entry costs refer to the full cost of entry, which only firms with no transferable excess resources face. Utilization costs equal entry costs when an entrant firm has no tangible or intangible assets to use in its new market, a situation likely to arise when a potential entrant has no existing related businesses. At the other extreme, when an entrant has all the resources required to compete in its new market, as can be the case with horizontal expansions, it needs no complementary resources, and utilization costs will approach zero.

Utilization costs will figure in choices between the two modes of en-

try—direct entry or acquisition—if there is a cost distinction between the two. It is unlikely that in a semistrong efficient capital market,[1] in which all resources are fairly valued on the basis of publicly available information, the costs of acquiring complementary resources are going to be lower under either mode. On the average, it would be equally costly to buy or develop a brand name. However, a business targeted for acquisition will generally have resources besides the complementary ones. To the extent that those other resources duplicate an entrant's excess resources or are required to compete in other markets not of interest to the entrant, they become redundant, tie up financial resources, and add to the entrant's overall utilization costs. Of course, if these unwanted resources are perfectly divisible, under the semistrong market assumption the acquirer would be able to recover the extra financial outlay by selling off these resources. In reality, however, it is difficult to sell parts of a production facility. Even if these unwanted resources represented autonomous plants or staff functions, the acquirer is not likely to recoup the correct value for two reasons. First, a firm as a collection of resources enjoys firm-specific "quasi-rents"[2] that will be lost when the resources are "unbundled," especially if the resources are related. Second, the market for a specific resource, like an individual plant, is likely to be a lot thinner than the market for an entire firm, and this will also lower the resale value. The probability of acquiring unwanted resources thus lowers the incentive for acquisitive entry. Figure 1 summarizes the implications of the two modes of entry vis-à-vis the cost of complementary resources.

Turning to the reduction in operating costs transferable resources provide under the two modes of entry, I considered a company contemplating entry into a market to utilize the cost savings from its excess resources. Assume that there is at least one business in the target market that has the complementary resources the potential entrant needs and thus is a candidate for acquisition. The reduction in operating costs the two modes of entry will offer depends on many factors, including the nature of the excess resources, the number of potential entrants, the likelihood and the modes of their entry, the extent of competition in the target market, and the reduction in operating costs each potential new entrant can expect. Generally, however, if an entrant can expect a large reduction in operating costs from excess resources and requires few complementary resources, it is likely to prefer direct entry.

The preceding suggests that when reductions in operating costs from excess resources are large and the costs of unwanted resources are high,

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[1] Under "semistrong-form efficiency," the prices of capital assets incorporate all public information. Most relevant research has tended to support this idea. In contrast, "strong-form efficiency" requires that all information, public and private, be incorporated in capital asset prices. Although the Capital Asset Pricing Model (CAPM) is based on the premise of strong-form efficiency, none of the available evidence supports that premise (Finnerty, 1976). The most recent theoretical developments in finance are beginning to take this into account.

[2] Quasi-rents arise when resources have a higher value when combined together than when they are separate.

FIGURE 1
Costs of Physical and Knowledge-based Resources Under Two Modes of Entry

	Cost of Unwanted Resources	Cost of Complementary Resources[a]
Acquisition	Yes	Yes
Direct Entry	None	Yes

[a] The magnitude of costs are the same for acquisition and direct entry.

utilization costs are lower for direct entry than for acquisition. But what are the strategic implications of mode selection for various classes of resources and market-structure influences?

Physical and Knowledge-based Resources

Physical and tangible resources include plants, equipment, land, and distribution channels. Knowledge-based, intangible resources include marketing and innovating skills and management know-how. Both classes of resources are indivisible to a degree and may exceed current requirements, and therefore the prospect of reducing operating costs may be a strong incentive to a firm to use them in new markets. As a general rule, the probability that an entrant's current excess physical and knowledge-based resources can reduce operating costs in a new market is higher the more related the new market is to the entrant's core markets (Teece, 1982). Also, the more closely related the two markets are, the fewer the needed complements to the firm's own physical and knowledge-based resources. An acquisitive entry in a related market is, therefore, more likely to involve the purchase of unwanted assets.[3] On the other hand, reductions in operating costs from excess resources for unrelated entrants are likely to be lower, the requirements for complementary resources higher, and the probability of acquiring unwanted assets lower. Figure 2 summarizes these arguments.

Since reductions in operating costs from excess resources should be higher and the cost of unwanted assets lower for related than for unrelated entrants,[4]

Hypothesis 1: If an entered industry is related to the main

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[3] Thus, fewer horizontal acquisitions than unrelated acquisitions are likely to occur. Records kept by the Federal Trade Commission called the "large merger series" bear this out. However, my arguments are based on the average firm. Thus, horizontal acquisitions do occur but are proportionally rarer than direct entries.

[4] Singh and Montgomery (1987) observed that related acquisitions lead to higher premiums than direct entry, and premiums are higher still for horizontal acquisitions (Chatterjee, 1986).

FIGURE 2
Probability of Resource Requirements for Related and Unrelated Entrants

	Unwanted Resources Purchased	Complementary Resources Required	Reduced Operating Costs
Related	High Probability	Low Probability	High Probability
Unrelated	Low Probability	High Probability	Low Probability

businesses of an entrant firm; direct entry is more proba-
ble than acquisition.

Financial Resources

Financial resources are a medium of exchange for productive resources.
So long as the earnings potential of productive resources indicates a positive
net present value (NPV), advocates of conventional finance theory suggest
that corporations should "take every positive NPV project, regardless of
whether internal or external funds are used to pay for it" (Myers & Majluf,
1984: 187). The basic assumption behind this viewpoint is that the market
has all public and private information about the value of the resources
needed in the project and therefore is always willing to provide capital at the
correct risk-adjusted rate. The arguments about reducing operating costs
using idle excess resources thus do not directly apply to financial resources.

In reality, however, managers almost always feel they know more than
outsiders about the value of resources the managers directly control
(Williamson, 1975), a belief that may lead them to have a higher expectation
about the value of a project than the capital market does. The capital market
may fairly value resources on the basis of publicly available information, but
companies sometimes withhold internal information about projects to main-
tain a competitive position, and information sometimes takes much longer to
disseminate than the time limits on the decision allow (Finnerty, 1976;
Porter, 1980, 1985; Wensley, 1982; Yao, 1988). Apart from situations in
which managers actually have private information, quite often the capital
market will question the judgment of a company's management.[5] In such

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[5] In the early 1980s, Digital Equipment Corporation's (DEC) entry into networking was well
known to the capital market, but the market simply did not approve of it. That decision proved
to be very successful, and in the middle 1980s DEC's stock soared. Similarly Texas Instrument's
entry into the home computer market was well known and disapproved by the capital market.
When Texas Instrument pulled out of the home computer market, its stock price went up nearly
In both these cases, companies' managements made a decision, not based on private
(continued)

cases, the firm and the capital market will have different expectations about the value of a project. From a firm's perspective, generating financial resources from the capital market when the latter has low expectations about the value of a project implies that capital will be costlier than the internal valuation of the project justifies. This argument suggests that companies will use financial resources that require public valuation when there are relatively few differences in expectations between the capital market and the firms regarding the valuation of a project.

Financial resources can be categorized as follows: internal funds; funds raised from taking on low-risk debt through mechanisms like bank credit lines; and funds from high-risk debt, such as junk bonds and equity capital. Internal funds, and to a large extent, low-risk debt, do not require public valuation. Lenders of low-risk loans do scrutinize the use of funds, but the high credit rating of firms with low leverage reduces the risk of default and, therefore, the cost of their funds. Further, using a bank credit line involves dealing with a firm's personal banker, who is far more knowledgeable about the firm than the capital market. The personal quality of transactions with a bank and a sufficient cash flow allow the borrowers of low-risk funds substantial flexibility about their end use. High-risk debts and equity capital necessarily directly involve the capital market through investment bankers. When issuing new long-term debt creates a relatively high risk of default, as with junk bonds, such debt and the new equity issue come under strong public scrutiny. If the capital market disagrees with a firm's internal valuation of a project, the cost of funds is likely to be high (Myers & Majluf, 1984).[6]

Both anecdotal and empirical evidence support this argument, as the following attests: "Take media giant Gannet Co. It hasn't tapped the equity market since it went public in 1967. The company has financed its tremendous growth with internally generated funds and debt. 'We borrow as cheaply as we can, and we pay it back rather rapidly . . . with equity you've always got it out there and you've got to cover it with earnings' " (Laderman, 1988: 146). The article from which the quotation is taken suggests that firms prefer internal funds or debt and points out that few large firms raised equity capital, even in the recent bull market. Empirical evidence provides further support: selling new equity depresses a firm's stock price on the average (Myers & Majluf, 1984; Smith, 1986), which is to be expected if the capital market is unaware of or disagrees with the true potential of a project. Such

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information, but on judgment, which need not necessarily have led to the right choice. In both cases, the capital market's expectation was pessimistic and the move funded internally. More recent examples include Internal Business Machine's (IBM) investment in microchannel architecture and Compaq's decision to pull out of Businessland stores. Although the jury is out on these decisions, the capital market has clearly reacted negatively to these management judgments. Interestingly, the recent Delaware supreme court ruling in favor of the Time/Warner merger was based on the court's unwillingness to second-guess the managers of Time and Warner about the prospects of the merger.

[6] Myers and Majluf assumed managers are acting to benefit current shareholders.

depression further reduces the incentive to sell new equity even when stock prices are high.

It is more difficult for a corporation to exploit a private valuation when making an acquisition than a direct entry. The competition in the market for acquisitions usually exposes the true value of a target and eliminates the advantage of private information,[7] which reduces the incentive to use internal funds or funds acquired through low-risk debt for acquisitions. The current high use of junk bonds for acquisitions supports this observation. For direct entry, on the other hand, if the capital market is pessimistic about a firm's decision, it can only depress the firm's stock price. If the decision proves correct, the stock price will be restored to its correct level. Had the firm raised equity capital at the depressed price to fund the entry move, the new shareholders who bought their shares at the depressed price would have been the principal beneficiaries of the project. To benefit its existing shareholders, a firm should, therefore, fund projects with internal funds or low-risk, low-cost debt that does not require public valuation.

Although the arguments presented so far indicate that the utilization cost of equity in most cases is higher, or is perceived to be higher, than that of low-risk funds, situations in which a company's management believes the market has overvalued its stock are an exception. Since even with a high stock price, firms are reluctant to sell new equity, managements are motivated to exploit a high stock price by acquiring firms with exchange of stock (Copeland & Weston, 1983: 621; DeAngelo, DeAngelo, & Rice, 1984). This is because target firms, lacking insider information, may also overvalue a buyer's stock.[8] Figure 3 summarizes the utilization costs of financial resources.

The preceding discussion leads to these hypotheses:

> *Hypothesis 2: If an entrant has internal funds or low leverage and a relatively low stock price, direct entry is more probable than acquisition.*

> *Hypothesis 3: If an entrant has a relatively high stock*

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[7] Two recent examples should drive home the point. R. J. Reynold's management tried to buy the firm at $75, which the investment banking community characterized as stealing. Even though that figure represented a premium of nearly 50 percent over the pre-offer market price, the managers lost the deal to Kohlberg, Kravis, and Roberts at $109 (Kirsch, 1989: 72). According to televised reports, on February 16, 1989 Formica's board had approved its management's bid to buy the firm at $18. However, the stock later traded at $22. Clearly, the capital market did not accept that the firm could be sold below its expected break-up value of $25–$28.

[8] The conglomerates of the 1960s routinely exploited private valuations until the bubble burst in the late 1960s (Steiner, 1975: 105–109). They would acquire a firm with a low price/earnings ratio by stock exchange and still manage to retain a high price/earnings ratio for the combined firm. Such moves are feasible so long as the market sees them positively. Recently, Santa Fe agreed to be acquired by Henley but wanted all cash. Henley, however, wanted to make the deal through a stock exchange, with Henley's stock valued at the then market price of $25. It became clear that Henley considered its stock to be overvalued when it subsequently agreed to value its stock at $20.

FIGURE 3
Costs of Financial Resources Under Two Modes of Entry

		Financial Resources			
		Internal Funds and Loans		Equity Capital	
		Low-risk Loans	High-risk Loans	Low Stock Price	High Stock Price
Probability of Acting on Private Expectation	Direct Entry: High	Low	High	High	Medium
	Acquisitive Entry: Low	Medium	High	High	Low

price and does not have access to internal funds or low
leverage, acquisitive entry is more probable than direct
entry.[9]

Market-Structure Influences

In a competitive marketplace, the success of a firm's entry strategy de-
pends to some extent on the reactions of the incumbent firms. Retaliatory
moves by incumbents can often make good strategic moves unsuccessful
[Porter, 1980: 88–107]. Thus, the threat of retaliation represents an implicit
utilization cost that varies with a market's structure and mode of entry.

The threat of retaliation is high in a concentrated industry in which the
incumbents tend to be a few powerful firms who are very protective of their
market share. A direct entry strategy would be especially costly in such a
structural setting because a new entrant can gain market share only at the
expense of the incumbents. Put another way, direct entry would be likely to
incite a competitive battle, thereby raising entry costs, even for entrants
with many transferable resources. This battle is likely to be even more in-
tense in slow-growth industries than in fast-growth industries. In contrast,
the purchase of an incumbent firm would be less likely to touch off a de-
structive battle since no new productive sources of supply are introduced to
threaten the positions of the remaining incumbents.[10] Other authors have

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[9] When a firm has neither internal funds nor a high stock price, or has internal funds and
a high stock price, both modes of entry become feasible. Under these contingent situations, it is
unlikely there will be any observed association between financial resources and mode of entry.

[10] Clearly, sometimes an acquisition used as a base for expansion will attract retaliation.
However, more often than not retaliation is later in coming for acquisitive entry than direct
entry. For instance, it took a long time for Annheuser Busch to react to Phillip Morris's entry
into the beer market. Gallo Brothers responded to Coca Cola's entering the wine market only
after seven years. By contrast, direct entry by even small players can invite retaliation. Both
Freddie Laker (Skytrain) and Donald Burr (People's Express) found this to be the case (Byrnes,
1989: 74–75). I would like to thank Arnie Cooper for pointing out this relationship.

made similar predictions, suggesting that in highly concentrated industries, the minimally efficient scale for plants is typically large, posing a high entry barrier that can be overcome only by acquisitive entry (Gorecki, 1975; Macdonald, 1984; Yip, 1982). According to the resource-based argument proposed here, however, scale-related barriers are not a strong deterrent to firms whose excess resources include excess plant capacity. Nevertheless, direct entry into an industry in which the minimally efficient scale for plants is large implies that an entrant may have to take market share away from incumbents, which reinforces the retaliation argument proposed earlier. Both lines of reasoning lead to the following:

> *Hypothesis 4: If the concentration ratio of an entered industry is high, acquisitive entry is more probable than direct entry.*

Although testing Hypothesis 4 requires controlling for the growth of an entered market, such growth might itself influence decisions as to mode of entry. A market's growth will often attract entry; it is less clear if the rate of growth will influence the mode of entry. High growth means that established firms can realize growth goals, even when losing market share. Therefore, it may be easier to capture market share by direct entry, an argument Porter (1980) and the Boston Consulting Group (1972) have made. However, if experience curve effects are important, or if it is important to achieve an early position with respect to key supply variables or channels of distribution, there might be a case for capturing early market share and thus for acquisitive entry. Further, in high-growth markets, established businesses with inadequate capital or nonsupportive parent corporations may be available for purchase because their position will otherwise deteriorate. This availability may provide an incentive for acquisitive entry. On the other hand, in young industries with rapid growth, no firms may be available for acquisition. Growth rates, therefore, will not be a significant determinant of mode of entry, at least in a large random sample.

> *Hypothesis 5: The growth rate of an entered industry should not influence mode of entry.*

METHODS

Sample

The study sample consisted of 47 randomly selected *Fortune* 500 corporations that entered at least five new 4-digit Standard Industrial Classification (SIC) product lines between 1961 and 1966. I identified the new product lines and the proportions of the companies' outputs attributable to each of them from the *Fortune Plant Directory* for 1961 through 1966.[11] I

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[11] Berry (1975: 52–88) fully discussed the *Fortune Plant Directory*, and several other researchers in industrial organization have used this data source. Here, I first determined the number of employees in each plant from the employment code provided by the directory and then used Berry's technique to determine the proportion of output attributable to each SIC code.

classified an entry as acquisitive if a new product line matched one described as part of the business of a firm acquired by the entrant the year before the new product line first appeared. I assumed that observations I could not trace to any acquisition after accounting for all acquisitions represented direct entries.[12] I dropped all new entries made in 1966 from the sample to ensure that the scale of direct entries could be measured one year after the time of entry. Observations were also dropped when product codes were not uniform across Bureau of the Census and Internal Revenue Service (IRS) sources[13] because such a lack of uniformity indicated an ambiguous product definition and lack of the firm-specific data needed to measure the independent variables. The final sample includes 144 individual diversification moves.[14] Since the *Fortune Plant Directory* is unavailable after 1966, the sample contained quite old data. The data's age should not detract from the merits of the results because my basic arguments should hold for a long time and continue to do so under similar macro environments.

Measures

Diversification measures. Mode of entry was a binary variable, with 1 for direct entry and 0 for acquisitive entry. Relatedness was measured with two constructs. I obtained a diversification profile of entrants before and after diversification moves using this formula:

$$\text{Diversification} = \sum_{i=1}^{n} d_{ib} p_i,$$

Berry described this technique, known as rectangular approximation, in detail (1975: 66, 76–78). Gorecki (1980) demonstrated that this method is as good as the two other commonly used methods—geometric approximation (Caves, Porter, Spence, & Scott, 1980) and primary approximation (U.S. Bureau of the Census, 1963: Part I, Table 4-b). Since the *Fortune Plant Directory* is not available on computer tapes, obtaining data from it is extremely time consuming. This is the primary reason for the relatively small size of the sample.

[12] The descriptions of the acquired firms were obtained from various sources, including annual reports, the *Wall Street Journal Index*, *Funk and Scott's Index of Corporations and Industries*, and *Moody's Industrial Manual*. Since categorizing product lines involved some judgment, two constraints were imposed on the sample. When a new product line appeared for the first time, I included it as an acquisitive entry only if the firm had completed an acquisition in the prior year and the acquired company's primary product line closely matched the new SIC code. If there was an acquisition but the time of the acquisition did not match a new product line, I dropped the observation from the sample to avoid categorizing a direct entry as an acquisition, or vice versa. In some cases, a firm would report one or more acquisitions that I could not trace to any new product line. Although it is possible that such an acquisition represented an existing product line, I dropped all new product lines appearing up to two years from the date of the acquisition to avoid misclassifying a mode of entry.

[13] Sources were the *Census of Manufacturers*, the *Internal Revenue Service Sourcebook of Statistics of Income*, and *Enterprise Statistics*.

[14] The full sample is available from the author.

where d_{ib} equals the distance of new industry i from a firm's largest business, b, and p_i equals the fraction of the firm's output in industry i.

Following Caves, Porter, Spence, and Scott, I made d_{ib} equal to 0 if i and b were in the same four-digit SIC code, d_{ib} equal to 1 if they were in the same three-digit SIC code, and so on (1980: 199–200). Diversification was thus measured as the extent to which a firm moved away from its core business, b. The degree of unrelatedness of an entry move was defined as the result of subtracting the value for diversification the year before a new entry from the diversification value for one year after the entry. Large values for this measure represent a highly unrelated diversification move.[15] I measured the sales attributable to a new entry one year after an actual move to ensure that the unrelatedness measure did not get biased in favor of acquisitive entries. The immediate scale of acquisitive entries is likely to be larger than that of direct entries immediately after a move.[16]

Financial measures. Empirically, it is not necessary to test separately for availability of internal funds and ability to raise funds from low-default-risk debt because low financial leverage usually indicates availability of internal funds. Firms with internal funds do not need to borrow. Low leverage in turn implies a low risk of default. Accordingly, I used the ratio of long-term debt to the market value of a firm, a standard measure of liquidity (Palepu, 1986), to represent internal funds and directly measure leverage. The lower the value of the variable for leverage, the lower the risk of a firm's debt and the higher its liquidity. I computed debt and market value from annual reports and the *Standard and Poor's Security Stock Guide* from the year before an entry.

Since leverage is likely to capture long-term liquidity and the cost of debt, I used the relationship of a firm's current ratio to the entered industry's current ratio to capture short-term debt and working capital. The industry data were from the IRS *Source Book of Income Statistics*. A high value for the relation to the industry current ratio represents low risks for lenders of short-term (operating) funds and a high level of working capital.

The ratio of a firm's average stock price the year before a diversification move to that of two years before was used to measure the cost of equity capital. The higher the value of this variable, the cheaper it is for a company to use stock as a medium of exchange.

Other measures. The four-firm concentration ratio—the percentage of sales captured by the four largest firms in an industry—was obtained from the *Census of Manufacturers* for 1958 and 1963. Large values for this variable indicate that a few large competitors may retaliate against a direct entry.

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[15] Although degree of unrelatedness is a continuous measure based on SIC codes, Montgomery (1982) demonstrated that such measures correlate strongly with the categorical measures of diversification Rumelt (1974) used.

[16] Directly entered enterprises may take several years to reach their targeted size. To that extent, the measure may still be biased in favor of acquisitive entries. I am indebted to an anonymous referee for this point.

Finally, I measured the growth rate of sales one year prior to an entry year to approximate expected growth rates, computing growth from sales data reported in the IRS *Source Book of Income Statistics*.

Statistical Analysis

A logistic regression analysis was used to test whether the hypotheses could explain the probability of direct or acquisitive entry. I estimated the following model (model 1) for the full sample: Mode of entry = a + b (unrelatedness) + c (leverage) + d (relation to industry current ratio) + e (stock price) + f (concentration ratio) + g (sales growth).

Hypothesis 1 predicts that b is negative. Hypothesis 2 predicts a negative sign for c and a positive sign for d. Hypothesis 3 predicts that e is negative. Hypothesis 4 predicts that f is negative, and Hypothesis 5 predicts that the g is not statistically significant.

Since Hypotheses 2 and 3 are contingent upon each other (see footnote 9), I divided the full sample into two subsamples. To estimate model 1a, I used a group in which the data points represent either the availability of low-cost capital or a high stock price, but not both. This subsample should provide support for Hypotheses 2 and 3 since in all cases companies will prefer either direct entry (low values for leverage and stock price) or acquisitive entry (high values for the two variables). The other subsample, which contains all the other cases, provided data for estimating model 1b, expected to be less supportive of Hypotheses 2 and 3. In this group, either internal funds and equity capital were cheap, making both modes of entry attractive, or the two types of financial resources were equally costly, making neither mode of entry particularly attractive. I expected the signs for models 1a and 1b to be the same as those for model 1, except that I did not expect the coefficients of leverage and stock price to be significant in model 1b.

RESULTS

Table 1 shows the means, standard deviations, and correlations of all the variables. On the average, the small magnitude of the coefficient for the measure of unrelatedness suggests that the new businesses entered were generally related to the entrants' core businesses, though there is a fairly large variance. The average four-firm concentration ratio of about .42 indicates a concentration level approaching oligopoly. The debt-to-equity ratio (leverage) is about .27, which is close to the average of .30 for large firms in the 1960s. The ratio of a diversifying firm's current ratio to that of the entered industry is 1.05, which seems to imply that the working capital requirements of the entrants and the entered markets were generally equal. The stock price of the entrants is about 10 percent higher at the time of entry than it had been a year before. The average annual gain in the stock market has historically (1920–80) been about 9 percent, including dividends, and the mean rate of growth is about .93. This implies that, on the average, the entered markets

TABLE 1
Means, Standard Deviations, and Correlations[a]

Variables	Means	s.d.	1	2	3	4	5	6	7
1. Mode of entry	1.65	0.48							
2. Unrelatedness	0.03	0.13	-.02						
3. Concentration ratio	0.42	0.25	-.13	.15					
4. Sales growth	0.93	0.21	.33	.03	.25				
5. Leverage	0.27	0.17	.32	.02	.14	-.15			
6. Relation to industry ratio	1.05	0.38	.60	-.02	.15	.43**	.18		
7. Stock price	1.11	0.18	-.71	-.01	-.15	-.48**	.01	-.66**	
8. Concentration-to-sales ratio	0.45	0.28	-.21	.15	.97**	-.00	.15	.04	-.03

[a] n = 144.
* p < .05
** p < .01

were actually experiencing decline, an unexpected result because in general the economy was expanding in the 1960s.

The growth rate is correlated with stock price and with the relation to the industry current ratio ($p < .01$), and stock price is also correlated with the latter ($p < .01$). These correlations need to be considered when interpreting the results of the estimated models.

Table 2 presents the results of the logistic regression for models 1, 1a, and 1b. In model 1, the degree of unrelatedness of an entered market has a negative coefficient as Hypothesis 1 predicts, however, it is not significant. The ratio of long-term debt to equity (leverage) has a negative coefficient and is significant at $p < .01$, supporting the second hypothesis. The ratio of an entrant's current ratio to that of the entered industry has a positive sign but is not significant. The sign of the relative current ratio is, however, in accordance with Hypothesis 2. The ratio of stock prices at the time of entry to those of the previous year has a negative coefficient, as Hypothesis 3 predicts ($p < .01$). The coefficient on the concentration ratio variable is significant at $p < .01$ and has a negative sign, as Hypothesis 4 predicts. The variable measuring the growth of an entered industry has a positive coefficient and is not significant, as Hypothesis 5 predicts.

The model as a whole is a good fit to the data, as the large logarithmic likelihood ratio indicates. This ratio can be used for inferences similar to those based on R^2 in general linear regression. I used the coefficients generated by the model to predict if each entry was direct or acquisitive. Although this was not an ideal method, only 9 percent of the sample points were misclassified. In a naive test, 50 percent of the points would be likely to be misclassified.

The results obtained for model 1a are consistent with those for model 1. Contrasting results obtained with model 1b with those for model 1a shows that the variable measuring leverage lost all significance in model 1b, as expected under the contingencies built into Hypothesis 2. However, contrary to similar contingent expectations based on Hypothesis 3, stock price retained its significance in both models. Model 1b also has the lower logarithmic likelihood ratio of the two.

DISCUSSION

The results indicate that concentrated markets and high stock prices favor acquisitive entry, and the availability of internal funds or funds from low-risk debt favor direct entry. An entrant's having a high degree of relatedness to an entered market favors direct entry, though not at a statistically significant level. The rate of an entered market's growth is not important in determining mode of entry.

Perhaps the most interesting finding of the study is the association between the different types of financial resources examined and mode of entry. In particular, the finding that in the absence of a high stock price, high levels of internal funds are associated with direct entry lends empirical support for

TABLE 2
Results of Logistic Regression Analysis for Mode of Entry[a]

Variables	Model 1 Predicted Sign	b	t	Model 1a Predicted Sign	b	t	Model 1b Predicted Sign	b	t
Constant		−31.22	−4.41**		−70.82	−2.34*		−33.24	−2.91**
Unrelatedness	−	−0.50	−0.24	−	3.03	0.82	−	−12.15	−1.18
Concentration ratio	−	−0.08	−3.84**	−	−0.12	−2.32*	−	−0.09	−2.88**
Sales growth		0.66	0.21		−21.56	−1.51		4.13	1.23
Leverage	−	−10.60	−2.82**	−	−12.18	−2.06*	−	−15.16	−1.06
Relation to industry ratio	+	0.97	0.70	+	−0.43	−0.14	+	2.01	0.94
Stock price	−	−22.00	−4.52**	−	−34.56	−2.64**	+	−25.77	−2.98**
Log likelihood			85.16**			82.77**			60.10**

[a] For model 1, n = 144; for model 1a, n = 71; for model 1b, n = 73. Significance levels for t are for two-tailed tests with 120 degrees of freedom.
* $p < .05$
** $p < .01$

the new generation of finance theories that claim that the method of financing an entry does matter.

The observed association between high stock prices and acquisitive entry is consistent with the hypothesis that large firms prefer to exploit a high stock price by exchanging it for an acquired firm's stock. However, the continued significance of stock price in model 1b suggests that the use of stocks for acquisitive entry is not contingent on the presence of internal funds or low-risk debt. It may be that managers use a high stock price more opportunistically than other financial resources since it is likely to be more transient than the internal funds generated from a "cash cow." Alternatively, a high stock price may reflect the benefits expected from an entry move rather than cause it. Whether companies anticipate these benefits as early as a year before a move and the extent to which they do so is an issue to be examined empirically. The finding about stock price may also reflect the prevalent 1960s mode of financing acquisitions through exchanging stock. Without a more selective research design, it is not possible to establish whether the medium of exchange was a consequence of the relative friendliness of the deals undertaken during that decade or of a rising stock market (Hypothesis 3). However, with the recent post-crash reemergence of firms buying other firms (*Business Week*, 1988), it will be interesting to see if stock exchange again becomes the prevalent mode of acquisition.

With internal funds measured by the relation of a company's current ratio to the prevalent ratio in the entered industry, the predicted association between internal funds and direct entry did not emerge. It could be that, unlike internal funds or long-term debt, short-term borrowing capabilities do not normally play an important part in a strategic move. Alternatively, perhaps the highly significant variable stock price dominates the relative current ratio since the two are correlated. To test this possibility, I reestimated model 1, dropping stock price. Table 3 reports the results as model 2.

In model 2, the relation to the industry ratio is significant. Caution about this result is in order, however. Since stock price explains a large portion of the variance in mode of entry and is correlated with the included variables, dropping the variable may lead to a misspecified model whose estimators are biased and inconsistent.

The market-structure factor that emerged as most important was the level of concentration in an entered market.[17] The observed association between high concentration and acquisitive entry does not in itself allow discrimination between two explanations: the competitive retaliation argument made here and the more common argument that concentrated industries have high entry barriers that can only be overcome through a merger. To directly test the retaliation argument, I reestimated model 1 by dropping the growth and concentration terms and substituting an interactive term, the

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[17] Yip (1982) found a similar association between high concentration in entered markets and acquisitive entry.

TABLE 3
Results of Logistic Regression Analysis for Mode of Entry[a]

Variables	Model 2			Model 3		
	Predicted Sign	b	t	Predicted Sign	b	t
Constant		−2.12	−1.61†		−32.88	−4.99**
Unrelatedness	−	−2.29	−1.22	−	0.16	0.08
Concentration ratio	−	−0.06	−5.20**			
Sales growth		0.73	0.61			
Leverage	−	−5.15	−2.77**	−	−12.11	−3.56**
Relation to industry ratio	+	1.95	2.65**	+	0.86	0.65
Stock price	−			−	−23.40	−4.86**
Ratio of concentration to sales growth	−			−	−0.05	−3.80**
Log likelihood			85.16**			77.39**

  [a] Significance levels for t are for two-tailed tests with 120 degrees of freedom; n = 144.
    † p < .10
    * p < .05
    ** p < .01

ratio of concentration to sales growth. For high growth and low concentration, this variable will have a low value. The retaliation argument suggests that such a market is least likely to invite retaliation. On the other hand, high concentration and low growth, which should yield a high value for this variable, are the conditions most likely to invite retaliation. This interactive variable should be associated with acquisitive entry for high values, but both modes are possible for low values, leading to an unambiguous prediction of a significant negative coefficient. The results presented in model 3 (Table 3) show that the sign of this interactive variable is in the direction consistent with the competitive retaliation argument ($p < .01$).[18]

The rate of growth of an entered industry does not by itself influence mode of entry, as Hypothesis 5 predicts. Further, growth's correlation with stock price does not account for its lack of significance, as is evident from model 2 (Table 3), which does not contain stock price.

The lack of support for an association between the closeness of an entered market and an entrant's core business was surprising. Yip (1982) made a similar prediction and also failed to identify any direct empirical association. However, Yip did find a significant association between a strong competitive position and direct entry. He argued that entry into a related market allows an entrant the possibility of enjoying a competitive advantage on at least some dimensions by virtue of shared resources. Yip's arguments are consistent with the utilization cost arguments made here. An example is

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  [18] In this sample, the entered markets were relatively concentrated on the average, and their growth rates were declining, conditions suggesting likely retaliation.

Phillip Morris's entry into the soft drink market. If Phillip Morris could be more efficient in terms of marketing than Cola Cola or Pepsi, it could pay the entry cost for a distribution channel and still compete effectively: the utilization cost advantage from marketing skills (a shared resource) would overcome the utilization cost disadvantage of establishing distribution channels (a complementary resource). The relatedness hypothesis can thus be extended to imply a positive association between a superior competitive position and direct entry. Thus, Yip did find at least indirect evidence to support the association between relatedness and direct entry, although this study did not.

One explanation for this contradiction could be that relatedness does not always lead to a superior competitive position, as a number of studies have evidenced (Elgers & Clark, 1980; Lubatkin, 1987; Michel & Shaked, 1984). The relatedness hypothesis might therefore depend on the sample or macro environment investigated. The period under study enjoyed a sustained expansion in which all firms might have been performing well, thus blurring the advantages of related entrants. However, no direct performance implications can be made from this study, although I would expect that entries that do not conform to the behavior predicted by this model would perform poorly.

There is also the possibility that mode of entry is not an independent decision but one taken in conjunction with or following a decision regarding the type of market—related or unrelated—chosen for diversification. In other words, the type of market entered may itself be a function of the resources of a firm (Chatterjee & Wernerfelt, 1988). This possibility could be explored by considering mode of entry and type of entered market in a simultaneous equation model. The models used here were not of that type, nor did they address all possible factors influencing mode of entry. These include CEO's prior experience (Song, 1982), organizational structure (Pitts, 1980), and noneconomic factors like entrant motivation and agency costs. Although the large logarithmic likelihood ratios produced here suggest full specification, the omitted factors may have affected the findings.

Finally, this study did not consider the issue of whether it is correct to enter a market in the first place, regardless of entry mode. Choice of markets needs to be investigated in future research because it may have performance implications over and above mode of entry.

Since the focus of this study was not on the ex post consequences of a strategic decision but on the ex ante factors that lead up to it, the results have limited practical implications for managing mode of entry. However, the study points the way to future research that may have stronger managerial implications. Such future research should be directed to understanding if the factors identified in this study have any bearing on the ultimate success of an acquisition—or, for that matter, on the success of direct entry. Or do factors like the integration of an acquisition and the implementation of a direct entry more directly influence performance? At a more general level, this study has important implications for research in firm diversification and

strategy content. For any strategic decision, it is difficult to evaluate the soundness of an original strategy on the basis of outcome alone because sound strategies can prove very difficult to implement. An investigation of the ex ante determinants of any strategic decision can therefore provide fresh insights for a literature concerned with the strategy-performance nexus. If, for example, a company made a "right" decision but had subsequent below par performance, research could be directed toward the intervening factors that might have contributed to poor performance.

CONCLUSIONS

This study addressed an important but underinvestigated aspect of firm diversification—the determinants of choosing a mode of entry. Results demonstrate that by integrating the concept of utilization costs, resource-based theories, and capital market imperfections into a new framework, it is possible to identify some of the determinants of the mode-of-entry decision. The study suggests directions for future research to further understanding of this decision in particular and of diversification in general. Finally, it underscores the importance of conducting further interdisciplinary research in strategic management, especially for questions that are otherwise difficult to address.

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VOICE MAIL VERSUS CONVENTIONAL CHANNELS: A COST MINIMIZATION ANALYSIS OF INDIVIDUALS' PREFERENCES

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Professional, technical, and administrative workers read a vignette describing a communication need and expressed a preference for the channel they would use to initiate a message. We manipulated such variables as message complexity and need for documentation. Results support eight of ten hypotheses derived from a perspective of cost minimization with exogenous variables accounting for about 21 percent of the variance. Cost minimization can apparently predict individual channel selections and provide a partial basis for managerial decisions about adopting voice mail.

Every time a member of an organization sends a message, he or she chooses a particular channel, such as a memorandum, a telephone call, or a face-to-face meeting. Such decisions are ubiquitous in organizational life since managers spend about 70 percent of the workday communicating (Ruchinskas, 1982: 13–15). Decisions about channel are important since they help determine the impact of specific messages and the effectiveness of message initiators. In the aggregate, such decisions help shape the effectiveness, efficiency, and ambience of an organization.

Contemporary organizations provide managers with a variety of communication channels and present scholars with a number of questions about when, why, and how people use various media. Such questions are significant because managers have to decide whether to purchase new and sometimes expensive technologies; because technologies can significantly affect the availability, timeliness, and quality of information, an increasingly important organizational resource (Huber, 1984; Saunders & Jones, 1990); and because communication technologies may ultimately prompt changes in organizational design, intelligence, and decision making (Huber, 1990). An improved understanding of individuals' channel selections should contrib-

ute to wise technology purchase decisions, help organizations encourage optimal use of available technologies, and facilitate appropriate changes in organizational design.

This article reports an experiment conducted in an organization with three years experience using voice mail. Voice mail is an increasingly popular computer-based messaging system accessed by telephone. People can use it as they would an answering machine to receive recorded messages or as they would memoranda to transmit recorded messages to one or many others. Several published accounts of voice mail's features are available (e.g., Beswick & Reinsch, 1987).

LITERATURE REVIEW

Descriptive studies of voice mail have consistently reported that users see it as easy to use, as facilitating prompt, complete, communication, and as useful for time-shifted interaction (Beswick & Reinsch, 1987; Ehrlich, Akiba, & Munson, 1983; Ehrlich, Cooper, Akiba, & Munson, 1984; Grantham & Vaske, 1985; Nicholson, 1985; Stewart, 1985; Stewart & Finn, 1985). Usage levels are related to user attitudes (Grantham & Vaske, 1985; Nicholson, 1985), and the use of advanced messaging features is associated with particular task environments (Shook & Rice, 1988).

Voice mail research has been limited, however, in three ways. First, studies have confounded exogenous variables, using observed messages that were both long and complex or short and simple, for instance (Nicholson, 1985). Second, since previous studies have been descriptive, they have hypothesized causal relationships but not demonstrated them experimentally (Grantham & Vaske, 1985); a partial exception is the time-ordered data of Shook and Rice (1988). Third, the research has lacked a comprehensive theoretical base, although Rice and his colleagues have partially remedied the lack of theory (Rice & Shook, 1990; Rice & Steinfield, 1991; Shook, 1988; Shook & Rice, 1988).

Shook (1988) focused on organizational patterns and showed that contingency theory can account for a significant part of the variance in whether voice mail is used to actively initiate or passively receive messages (Shook, 1988: 2, 22–24; Shook & Rice, 1988). Shook did not, however, attempt to identify the circumstances under which an individual worker will choose to send a message by voice mail (1988: 2, 24).

The currently reported project focused on the behavior of individuals and predicted their preference for voice mail as a medium by adopting a cost minimization perspective, with costs defined broadly in an economic sense. Specifically, we posited that (1) communicators are sensitive to a wide array of potential personal costs, (2) communicators use their perceptions of circumstances to assess the magnitude of potential costs and the probability of cost accrual, and (3) cost minimization is an important determinant of individual behavior in organizations. According to this perspective, communi-

cators attempt to make rational decisions by choosing media that minimize personal costs. These notions are consistent with evidence that effort avoidance is a fundamental determinant of human behavior (Zipf, 1949) and with evidence suggesting that easy access is crucial to media use (Rice & Shook, 1988).

The work of an economist (Marschak, 1968) laid the theoretical foundation for the cost minimization perspective. Marschak identified three areas in which analysts might estimate costs and associated probabilities: access, errors, and delays. Cost elements can be identified within each area.

Marschak conceptualized *access costs* as amounts of money associated with channel use, such as telephone charges. At least one other access cost, effort, can be identified. Effort costs include physical travel, such as walking to a meeting; physical activity, such as keyboarding a memorandum; and mental activity, such as learning to use an unfamiliar voice mail feature.

Marschak described *error costs* as signal discrepancies, or differences between transmitted and received codes. Three additional error costs are impact discrepancies, relationship disruptions, and blame. Impact discrepancies, or differences between the actual and intended effect of a message, can arise from signal discrepancies or from interpretive differences between the initiator and receiver of a message. For example, a memorandum may include a typographical error that changes its meaning or, though error-free, may be misunderstood. Relationship disruptions can result from impact discrepancies or from the symbolic dimensions of media (Trevino, Lengel, & Daft, 1987). For example, the receiver of a memorandum may misconstrue its emotional tone or regard its content as appropriate only for a face-to-face meeting. Finally, blame is perceived responsibility for signal discrepancies, impact discrepancies, or relationship disruptions.

Marschak's third category, *delay costs*, included encoding delays, the time elapsed while a message is encoded, and transmission delays, the time elapsed while an individual waits for an opportunity to transmit an encoded message. Two additional delay costs are reception delays and feedback delays. Reception delays occur because a message moves slowly or because the intended receiver does not access the medium regularly. For example, mail may be slow, or a potential recipient may rarely check his or her mailbox. Feedback delays result from reception delays or from lack of an effective feedback mechanism. Feedback is important because it permits the initiator of a message to detect and perhaps ameliorate other error costs.

THEORETIC RATIONALE AND HYPOTHESES

Anticipated costs may influence media choice in at least two ways. First, an increase in the anticipated costs associated with a medium should decrease preference for that medium. Second, since communicators must choose from the media available, an increase in the anticipated costs associated with one medium should increase preference for alternatives.

Physical Distance

Enlarging the physical distance between communicators increases the effort costs associated with face-to-face interaction, and several studies have indicated that increasing distance encourages the replacement of face-to-face interaction with electronic media such as video conferencing (Christie & Holloway, 1975; Christie & Kingan, 1977) or the telephone (Picot, Klingenberg, & Kranzle, 1982; Ruchinskas, 1982: 75–78; Steinfield & Fulk, 1986; Trevino et al., 1987: 567). Because physical distance increases the effort (access) costs of face-to-face meetings but does not affect access costs for voice mail, we tested the following:

> *Hypothesis 1: Preference for voice mail will be high when a message target is distant.*

Familiarity with Technology

A communicator's familiarity with a technology should affect the effort cost in terms of mental work associated with its use. People who have frequently initiated voice mail messages should anticipate lower effort costs than those who have rarely used voice mail to send a message. Thus,

> *Hypothesis 2: Preference for voice mail will be high when an initiator has frequently used voice mail's message-sending feature.*

Length

Long messages enlarge effort costs by requiring more mental and physical activity than short ones, but the rate of cost increase differs across media. To convey a long message face-to-face requires additional time and verbalization; to convey the same message by voice mail requires in addition that an initiator remember, without the benefit of memory-jogging feedback, to include and explain all parts of the message. Furthermore, as the message becomes longer, the probability of exceeding the time limits for voice mail software increases; long messages must be divided into two or more parts.[1] Because increasing message length produces a relatively rapid increase in the effort costs for voice mail,

> *Hypothesis 3: Preference for voice mail will decrease as message length increases.*

Complexity

A message's complexity, which we defined in terms of the amount of information its recipient will perceive as technical and unfamiliar (Irving,

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[1] Software at the research site permits messages up to 360 seconds in length. Divided messages are not common but do occur.

1981), should increase the costs of signal discrepancy because the recipient will have difficulty accurately reconstructing garbled signals. Complexity will also increase impact discrepancy, because the recipient is more likely to misunderstand a complex message than a simple one. As complexity enlarges the likelihood of signal discrepancy and impact discrepancy, it will also make feedback delay more costly since feedback delay postpones the detection and amelioration of signal and impact discrepancy. The relative strengths of various media with regard to such costs is best conceptualized in terms of channel richness (Daft & Lengel, 1984).

In contrast to lean channels like printed statistical data, rich channels like face-to-face communication permit multisensory redundancy, natural language interaction, and prompt feedback and so help to prevent or reduce discrepancy and delay costs. Voice mail is a relatively lean channel compared to the others included in the current study (Shook, 1988: 36); so, since complexity increases the potential for signal discrepancy (error cost), impact discrepancy (error cost), and feedback delay (delay cost), we tested the following:

> *Hypothesis 4: Preference for voice mail will be low when*
> *the content of a message is complex.*

Task

If a managerial task involves using many resources, the potential seriousness of impact discrepancy is high. If a managerial task involves relationships, the relevance of relationship disruption costs is high. Consequently, for tasks that are significant or that involve relationships, rich media—media that protect against impact discrepancy and relationship disruption—should be less costly than lean media.

Task can affect channel choice (Christie & Holloway, 1975; Conrath, 1978), and the concepts of cost and channel richness (Daft & Lengel, 1984) explain why people prefer rich media for significant tasks: rich media help control error costs. Research using the concept of social presence,[2] which is parallel to that of channel richness, has concluded that mediated interaction became progressively less appropriate as a task changed from giving information to problem solving or conflict resolution (Short, Williams, & Christie, 1976: 149–151). Because high levels of task and relationship seriousness increase the error and delay costs associated with lean media,

> *Hypothesis 5: Preference for voice mail will be low when*
> *a task involves significant resources or affects personal*
> *relationships.*

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[2] Social presence, the central explanatory concept of the pioneering Communication Studies Group, was defined as "a single dimension representing a cognitive synthesis of . . . the [medium's] capacity to transmit information about facial expression, direction of looking, posture, dress and non-verbal vocal cues" (Short et al., 1976: 65).

Reaction

Previous research has largely neglected the relationship between the emotional tone of an interaction and channel choice (cf. Short et al., 1976: 37–41). However, Hiemstra (1982) suggested that people who anticipate a negative reaction may select a channel that maximizes face-saving options. Anticipating a negative reaction implies a high risk of relationship disruption and feedback delay costs, so a communicator who anticipates a negative reaction to a message is likely to prefer rich media. (An ineffective manager might use lean media to avoid negative feedback but this will eventually multiply costs and perhaps lead to failure.) Because the error and delay costs associated with voice mail may be high,

> Hypothesis 6: Preference for voice mail will be low when
> a negative response is anticipated.

Level

Daft and Lengel (1984, 1986) argued that people at high organizational levels process more ambiguous or equivocal information than those at low levels and consequently use richer media than the latter. Cost analysis focuses on the symbolic meaning of media (Trevino et al., 1987) and the potential for relationship disruption (error cost) through use of an inappropriate channel. Upper-level managers communicating horizontally should tend to rely on their normal channel (face-to-face interaction) rather than risk selecting a less appropriate channel. Lower-level managers who use mediated channels frequently should regard voice mail as less risky than upper level managers. Thus,

> Hypothesis 7: Preference for voice mail will be lower
> among upper-level managers than lower-level managers.

Documentation

The need to document an exchange should encourage use of an artifact-producing medium such as writing. Cost analysis explains this as an effort to reduce blame costs since message initiators can use written records to demonstrate that they met their responsibilities. Woodward noted that managers used writing to "clear themselves in the event of a dispute" (1980: 67). Trevino and colleagues (1987: 567) found that managers who had used writing said it provided "a permanent record," unlike electronic mail or the telephone (cf. Picot et al., 1982: 683). Voice messages can be retained, of course, but only by a message's recipient. Because the potential for blame is high when documentation is desirable,

> Hypothesis 8: Preference for voice mail will be low when
> documentation is needed.

Time Spanning, or Work Shift

Contemporary scholars have distinguished between synchronous and asynchronous media. An asynchronous medium like voice mail seems es-

pecially suited to interaction between individuals who work different shifts (Beswick & Reinsch, 1987; Ehrlich et al., 1983; Trevino et al., 1987: 567). Because using synchronous media to span time differences produces delay costs,

> Hypothesis 9: Preference for voice mail will be high when a message target is on a different work shift than a message initiator.

Dual-Channel Messages

Communicators rarely confront absolute either-or decisions about channel use—instead, they can combine various channels or divide a message in two. For example, they can send an explanatory voice memo about a written report (Nicholson, 1985).

Cost analysis suggests that heightened error costs will enhance preference for dual-channel messages, which heighten redundancy and reduce errors. Two studies have provided partial support for this notion: Porter and Roberts suggested that multimedia messages should reduce distortion (1976: 1563), and several of the respondents in the study by Trevino and colleagues described messages as a "backup, followup, [or] supplement to [another] message" (1987: 565). Thus,

> Hypothesis 10: Preference for dual-channel messages will be high when potential error costs are high.

METHODS AND PROCEDURES

We were monitoring the research site when, on short notice, a limited opportunity to conduct a controlled study arose. We constructed a vignette and collected data before we had fully articulated the cost minimization perspective. Thus, we did not empirically verify the link between concepts, such as access costs, and operational definitions, such as physical distance. The result is a study in which theory guides analysis but which stops short of a rigorous test of Marschak's (1968) theory.

The target population for this study consisted of administrative, professional, and technical workers at a North American industrial company that operated 24 hours a day. Workers in the target population had access to a voice mail system that had been in operation for three years. We prepared a vignette describing a hypothetical communication and manipulating independent variables in a completely crossed design (Alexander & Becker, 1978). The text of the vignette appears in the Appendix.

The vignette asked respondents to assume that they needed to initiate a message to another worker at the site and systematically manipulated seven exogenous variables, shift (1 = same, 2 = different); physical distance (1 = near, 2 = far); task (1 = an answer to a question, 2 = a suggestion to solve a problem, 3 = a proposed resolution for a dispute); message length (1 = short, 2 = long); message complexity (1 = simple, 2 = complex); expected

reaction (1 = favorable, 2 = unfavorable); and need for documentation (1 = unnecessary, 2 = desirable).

We measured two additional exogenous variables, including organizational rank in the design by using internal identification numbers to sort workers into lower and upper organizational levels. We assessed familiarity with the voice mail messaging feature by counting the number of messages each respondent had initiated during the preceding six months, information collected automatically by the voice mail software. Using a median split, we divided respondents into less- and more-familiar users; almost all those designated as less familiar with the feature had not initiated a single message during the period.

Completely crossing the manipulated variables yielded 192 versions of the vignette. We asked each respondent to read a single, randomly assigned version of the vignette and to complete a constant-sum scale. The questionnaire identified all six single-channel communication options available at the site and several dual-channel options noted during pilot testing; in addition, it asked respondents to identify the options they would consider using and to distribute 100 points to indicate the probability of their using each channel or combination of channels. An opportunity to add combinations was included. All professional, technical, and administrative workers on the voice mail system (N = 1,400) received the questionnaire; we received responses from 1,000 (71%). We did not collect demographic data from respondents, but more than 90 percent of the members of the parent population were white men with ages ranging from 23 to 65 years.

The use of a constant-sum scale placed respondents in a forced-choice situation and served two positive purposes. First, it mirrored reality, since message initiators choose from the media available (Bauernfeind, 1967: 219–221). Second, it helped reduce distortion. The company had made explicit efforts to encourage use when voice mail was introduced, so some employees might have been tempted to exaggerate their positive reactions while responding to a company-sponsored study of voice mail. A forced-choice format tends to reduce such exaggration (Bauernfeind, 1967: 219). On the other hand, forced-choice scales yield ipsative data.

Clemans (1966) clarified difficulties with ipsative data, but a complete analysis strategy is not yet apparent (Bauernfeind, 1967). Ipsative scores provide valid intraperson measures but do not provide trustworthy measures of interperson effects. The experimental hypotheses concerned interperson comparisons, so making some type of transformation was imperative. Since ipsative scores facilitate identification of individual preferences (Lemke & Wiersma, 1967: 219), the analysis focused on each respondent's preferred channel.

The dependent variable was the specific channel each respondent preferred. We scrutinized each person's responses and were able to identify a preferred option for 750 respondents. The remaining 250 respondents reported equal probabilities of using two or more channels. To avoid exces-

sively small cells, we grouped handwritten and typed messages under written. We reexamined responses to designate each respondent as preferring a single- or dual-channel message, with identification possible for 985 respondents. The remaining 15 respondents reported equal probabilities for a single- and a dual-channel choice. The Appendix describes the process of identifying respondents' preferences.

"Logit" analysis (Aldrich & Nelson, 1984, Steinberg, 1985) was used to test the hypotheses. This method, an analogue of multiple regression, is appropriate when the dependent variable of interest is qualitative and polychotomous. Logit analysis generates a chi-square test of model significance and enables calculation of a pseudo R^2 (Aldrich & Nelson, 1984: 57). Computed probability changes in individual cells can be used to describe the direction of observed effects; probability changes can also be used to test differences between designated cells. The disadvantages of this analytic method include restrictions on sample size; the appropriate size is a function of the number of independent variables and the number of categories in the dependent variable (Aldrich & Nelson, 1984).

RESULTS

Respondents reported considering all 6 of the listed communication options—face-to-face discussion, telephoning, using voice mail, writing a note, typing a note, and telephoning the target's secretary—and 15 dual-channel combinations of the 6 alternatives. No respondent included a combination of more than 2 channels.

Respondents' single-channel first choices were as follows: face-to-face, 271; telephone, 121; written (typed or handwritten), 241; voice mail, 117; and no preference (tied choice), 250. Respondents who preferred to use a single channel numbered 682; 303 respondents preferred a dual channel, and 15 had no preference.

A test was conducted to determine if missing data were distributed as a function of independent variables. The results of a logit analysis including all independent variables, with channel choice scored as present or absent, were insignificant ($\chi^2 = 13.49$, $df = 9$), suggesting that failure to indicate a preference was not a function of experimental variables. The number of respondents (15) who did not indicate a preference between using a single- or dual-channel message was too small to permit a similar test.

The number of respondents was not large enough to permit a simultaneous test of all hypotheses, so we grouped the independent variables and tested them by cost area. Table 1 summarizes results. The first cluster contains results for variables based primarily on access costs, the effects of which are predicted in Hypotheses 1, 2, and 3. The overall access cost model was significant ($\chi^2 = 55.24$, $df = 9$): access costs accounted for about 7 percent of the variance in the dependent variable. Follow-up t-tests (Table 1)

TABLE 1
Results of Logit Analysis for Channel Choices[a]

Cost Variables[c]	Probability Changes[b]				χ^2	df	Pseudo R^2
	Face-to-face Communication	Tele-phone	Written Communication	Voice Mail			
Access costs					55.24**	9	.069
Distance	−.046	.018	−.021	.049			
Familiarity	−.065	−.068	−.024	.157			
Length	.074	−.044	.030	−.060			
Error costs					96.10**	15	.144
Complexity	.193	−.067	−.061	−.065			
Task	.027	−.019	−.000	−.008			
Reaction	.179	−.056	−.051	−.072			
Organizational level	.043	−.027	−.026	.010			
Need for docu-mentation	−.085	−.017	.195	−.093			
Delay costs					50.56**	3	.063
Shift	−.189	−.069	.144	.115			

[a] $N = 750$.

[b] Values in the body of the table represent changes in the probability of a particular channel being selected; the changes are the results of increments in the exogenous variables. For example, distance reduced the probability of a preference for face-to-face (−.046) or written (−.021) communication and increased the probability of a preference for using telephone (.018) or voice mail (.049).

[c] Values for the first three channels printed in boldface differ on a t-test ($p < .05$) from the value for voice mail on the same row. For example, distance produced changes in probability that were significantly different when voice mail was tested directly against face-to-face and written communication.

** $p < .01$

indicated that distance, familiarity, and message length significantly affected the probability of preferring voice mail.

The second cluster contains variables based primarily on error costs. Hypotheses 4, 5, 6, 7, and 8 predict effects for these variables. The overall error cost model was significant ($\chi^2 = 96.10$, $df = 15$); error costs accounted for about 14 percent of the variance. Complexity, reaction, and need for documentation significantly affected the probability of preferring voice mail.

The third cluster contains results based on delay costs and predicted in Hypothesis 9. The overall delay cost model was significant ($\chi^2 = 50.56$, $df = 3$); delay costs accounted for about 6 percent of the variance in the dependent variable. The message target's work shift significantly affected the probability of preferring voice mail.

To obtain an estimate of total variance accounted for, we placed the six variables that demonstrated the strongest single-variable effects in a combined model. Given the number of categories in the dependent variable and

TABLE 2
Results of Logit Analysis for Single and Dual Channels[a]

Cost Variables[c]	Probability Changes[b]		χ^2	df	Pseudo R^2
	Single Channel	Dual Channel			
Error costs			14.81*	5	.015
Complexity	−.007	.007			
Activity	−.009	.009			
Reaction	.007	−.007			
Organizational level	**.041**	**−.041**			
Need for documentation	**−.099**	**.099**			

[a] $N = 985$.

[b] Values in the body of the table represent changes in the probability of either a single or dual channel being selected; the changes are the result of increments in the exogenous variables. For example, an increase in organizational level increased the probability of preference for a single-channel message (.041) and, since this analysis included only two possibilities, it correspondingly increased the probability of preference for a dual-channel message (−.041).

[c] Probability values on a single row that are printed in boldface differ from each other on a t-test ($p < .05$).

* $p < .05$

the number of respondents, a simultaneous test of more than six variables was not likely to be statistically reliable (Aldrich & Nelson, 1984: 73, 81). The model, which included familiarity, length, complexity, reaction, documentation, and shift, yielded significant results ($\chi^2 = 196.32$, $df = 18$); these variables accounted for about 21 percent of the variance in the dependent variable.

A final logit analysis was conducted to test Hypothesis 10, which contrasts single- and dual-channel choices. Table 2 reports results. The overall model was significant ($\chi^2 = 14.81$, $df = 5$); error costs accounted for about 2 percent of the variance. Organizational level and a need for documentation significantly affected the probability of choosing a dual-channel message.

DISCUSSION AND CONCLUSIONS

Research hypotheses predicted high and low preferences for using voice mail and a dual-channel message. The results of specific comparisons between voice mail and other media reveal support for eight of the ten hypotheses tested. For example, values in Table 1 indicate that an increase in physical distance enhanced the probability of preferring voice mail (.049) or the telephone (.018) and reduced the probability of preferring face-to-face (−.046) or written communication (−.021). Voice mail differed significantly from face-to-face and written communication, supporting Hypothesis 1;

physical distance enhanced preference for voice mail. Results also supported Hypotheses 2, 3, 4, 6, 8, 9, and 10. Only Hypotheses 5 and 7, postulating effects for the task represented and organizational level, received no support.

The results yield five conclusions. First, they support several hypotheses about voice mail. Low access and delay costs enhanced the probability of people's using voice mail, and high access and error costs reduced it. These are the first experimental data that identify factors affecting preference for voice mail; they confirm prior descriptive studies and extend the knowledge base by demonstrating effects in a factorial, experimental context.

The failure to confirm Hypotheses 5 and 7 may be due to any of several factors. Hypothesis 5 predicted that the managerial activity a communication represented (answering a question, making a suggestion, or resolving a dispute) would affect channel preference. The brief vignette may not, however, have included enough information to fully evoke the intended situations. A brief description of physical distance or message length may be sufficient, but greater detail and explanation may be needed to suggest that significant resources or relationships are at risk. Failure to confirm Hypothesis 7 may stem from inaccurate assessment and incorporation of respondents' perceptions of the appropriateness of voice mail—we may have misjudged the symbolic meaning of the medium for people at various organizational levels.

Second, the results provide data about factors that stimulate message initiators to use more than one channel. Previous research has noted that as persons exchange messages about a topic they may move from one medium to another, from telephone to written contract for instance. Research also indicates that receivers may respond differently to multisensory presentations than to those invoking one sense (Smeltzer & Vance, 1989). But prior research has not addressed the question of what stimulates a person to use more than one channel. At least part of the answer seems to be that message initiators with relatively low positions in their organizational hierarchy and a need to document their messages may choose dual options. Cost analysis suggests that one important function of documentation is to protect people against blame. Managers located relatively low in an organization may likewise use more than one channel to protect themselves from blame.

Third, the results provide preliminary support for the cost minimization perspective. Additional work is needed to link cost concepts empirically to operational definitions like those used in this study, to account for a full menu of channel preferences in addition to preference for voice mail, to assess both anticipated costs and associated probabilities precisely, and finally, to definitively test the cost minimization model. This modest first effort does suggest, however, that taking a cost minimization perspective can explain variance in individual preference for voice mail and can contribute to the relatively atheoretical field of channel choice.

Fourth, the results suggest that additional research attention to channel

selection is desirable. Managers frequently make channel selections, often choosing from a menu that includes several new and expensive technologies. Given the frequency and potential importance of such selections, management scholars should provide both descriptive and prescriptive treatments of the phenomenon. Daft, Lengel, and Trevino (1987) demonstrated that medium choice is related to managerial effectiveness. The current results suggest that medium choice is in part an attempt to reduce perceived personal costs. Taken together, the two studies suggest that channel choice is a significant and controllable variable, likely to become more important as the world continues to move toward an information economy.

Finally, the present results help to identify circumstances in which organization members might use voice mail heavily. Environments in which people send many short, simple, noncontroversial, undocumented messages over moderate or great distances and across chronological boundaries appear to be excellent candidates for voice mail systems—if training programs can stimulate employees' initial use. Voice mail may be less successful in other environments because of employees' efforts to minimize personal costs.

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APPENDIX

Vignette Text with Options

Message. You need to send a message to Terry who works in a different division. Terry is the same sex as you and has the same job level as you. You and Terry are well acquainted at work but seldom socialize away from work. You work only dayshift [and Terry is] [but Terry is not] on dayshift for the next two weeks. Terry's office is located in [the same building as you but on a different floor] [another building located about 200 yards away from your building]. A receptionist is available to answer Terry's phone. Mail is delivered to Terry's maildrop twice a day.

The message you need to send is [a factual answer to a question Terry asked you] [a suggestion about how to solve a problem in Terry's division] [your latest effort to resolve a dispute between your division and Terry's division]. The message is [short (the message can be expressed in about 30 words)] [long (the message can be expressed in about 500 words)] and the content of the message is [simple (containing ideas and information which will be familiar to Terry and which will be easy to understand)] [complex (containing ideas and information which will be new to Terry and which may be hard to understand)]. Terry will probably react [favourably] [unfavourably] to the message and may, perhaps, react to you the same way since you are the source of the message.

In this case you [do not need to keep any] [might later want to have some] sort of record of the content of the message you send.

Identification of Respondents' Preferences

Because only 7 respondents selected using a target's secretary as an intermediary as their preferred channel, meaningful analysis of this choice was not possible. Thus, we assigned respondents who made this choice to their second choice. All individuals who, on the basis of

their stated probabilities, could be unambiguously assigned to a single channel preference were so assigned (N = 561). We assigned respondents whose first choice was a dual-channel message to one of the two single channels when we could identify a clear preference by examining second or subsequent choices (N = 189). For example, we designated a person who stated a 70 percent probability of using the telephone plus a letter and a 30 percent probability of using the telephone plus a face-to-face meeting as having the telephone as first choice.

Designating preferences for single- or dual-channel messages proceeded in a similar fashion except that we kept the secretary-as-intermediary choice as a single-channel option. A person who reported a 50 percent probability of using the telephone and a 50 percent probability of using a typed letter, for example, was designated as preferring to use a single channel.

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RESEARCH NOTES

PERCEPTUAL AND ARCHIVAL MEASURES OF MILES AND SNOW'S STRATEGIC TYPES: A COMPREHENSIVE ASSESSMENT OF RELIABILITY AND VALIDITY

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Despite the widespread research use of Miles and Snow's typology of strategic orientations, there have been no systematic attempts to assess the reliability and validity of its various measures. The present work provides such an assessment using data collected at two points from over 400 organizations in the hospital industry. We examined dimensions of the typology using both perceptual self-typing and archival data from multiple sources. The results generally support predictions across a variety of measures. Implications for further testing and research are discussed.

An important issue in organizational research is the extent to which a top management's assessment of its organization's strategy is a reliable and valid measure (Ginsberg, 1984; Ginsberg & Venkatraman, 1985; Venkatraman & Grant, 1986). Establishing the reliability and validity of such "self-typing" measures is important because archival data may be unavailable, incomplete, or unusable. The present study sought to address this need by systematically assessing the reliability and validity of measures of Miles and Snow's (1978) typology of strategies, which divides organizations into prospector, defender, analyzer, and reactor types. We examined Miles and Snow's typology because of its widespread use in the literature on strategy (Hambrick, 1981; Hambrick, 1983; Miles & Cameron, 1982; Smith, Guthrie, & Chen, 1986; Snow & Hrebiniak, 1980; Zahra, 1990; Zajac & Shortell, 1989) and its ability to measure strategy at a level of abstraction sufficient to apply across a wide variety of organizations and industries. Research has also suggested a general congruence between Miles and Snow's categories and Porter's (1985) cost leader and differentiator categories (Segev, 1989).

Using perceptual and archival data from two time periods, we took a multiple indicators approach emphasizing the convergent validity (Camp-

bell & Fiske, 1959) of measures of the typology. We also examined the typology across a variety of strategic contexts, including intended versus realized strategy (Mintzberg, 1978), portfolio approaches to strategy (Henderson, 1973), and the rates at which new products and services are introduced (Hambrick, 1983).

MILES AND SNOW'S TYPOLOGY

Miles and Snow (1978) suggested that an organization's strategies have three domains: the entrepreneurial, relating to how the organization orients itself to the marketplace; the administrative, embracing how the organization attempts to coordinate and implement its strategies; and the technical, referring to the technology and processes used to produce the organization's products and services. A firm following a *prospector* strategy frequently adds to and changes its products and services, consistently attempting to be first in the market. Such a firm tends to stress innovation and flexibility in order to be able to respond quickly to changing market conditions. An *analyzer's* strategy is to maintain a relatively stable base of products and services while selectively moving into new areas with demonstrated promise. An analyzer tends to emphasize formal planning processes and tries to balance cost containment and efficiency with risk taking and innovation. A *defender's* strategy is to offer a relatively stable set of services to defined markets, concentrating on doing the best job possible in its area of expertise. It emphasizes tight control and continually looks for operating efficiencies to lower costs. A *reactor* essentially lacks a consistent strategy. Its strategy has characteristics of each of the other type's strategies at different times and thus is difficult to categorize clearly.[1]

As noted, researchers have used the typology to study strategic behavior in a wide variety of organizations and industries. Snow and Hrebiniak (1980) found that prospectors, analyzers, and defenders outperformed reactors in competitive but not highly regulated industries. Hambrick's (1983) data indicated that defenders consistently outperformed prospectors in profitability and cash flow but that prospectors outperformed defenders in market share gains in innovative industries. Zajac and Shortell (1989) discovered that prospector and analyzer hospitals outperformed defender hospitals in the rapidly changing health-care environment, results that Shortell, Morrison, and Friedman (1990) subsequently confirmed. The typology has also been used to differentiate tobacco firms' responses to environmental threats (Miles & Cameron, 1982) and to examine the behavior of small hospital systems (Luke & Begun, 1988).

A recent extensive review of research using the Miles and Snow typology found few attempts to assess the reliability or validity of its measures

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[1] Since reactors are defined as lacking a consistent strategy, no a priori predictions can be made regarding their behavior. We thus excluded them from formal consideration in hypotheses and analyses. This study's Discussion section briefly considers reactors.

systematically (Zahra, 1990). Snow and Hambrick (1980) and Hambrick (1981) reported interrater reliability assessments for expert raters ranging from .49 to .76 and Boeker (1989) reported reliabilities ranging from .57 to .82. Hambrick (1983) also found that prospectors had a significantly higher ratio of research and development expenses relative to sales than defenders and a significantly higher ratio of marketing expenses to sales. Smith and colleagues (1986) found mixed support for the typology's validity. For the most part, researchers have inferred its validity from various qualitative observations without conducting further testing (Miles & Cameron, 1982; Miles & Snow, 1978; Snow & Hrebiniak, 1980). Hambrick, noting the general absence of multiple indicators and the lack of reliability and validity tests in previous research, suggested that the assumed validity of the strategic typology may "have yielded the appearances of a more powerful typology than may in fact exist" (1983: 7).

HYPOTHESES

Since the typology defines prospectors as consistently first in adopting new ideas and developing new products and new markets and as more risk oriented than the other types (Hambrick, 1983; Miles & Snow, 1978; Smith et al., 1986), we expect prospectors to score highest of all the types on measures of the entrepreneurial dimension of the typology. Defenders, with their emphasis on technical efficiency and protecting their base business, should score lowest on those measures. Analyzers, who use components of both the prospector and defender strategies, should score in between. Specifically,

> Hypothesis 1: Organizations classified as prospectors are likely to (a) place greater emphasis on new service and new market development strategies, (b) offer more diversified services—services that are not part of their core business—(c) have initiated more diversified new services in recent years, (d) have a higher ratio of diversified to nondiversified services, (e) offer more high-technology services, and (f) have a greater number of new diversified services planned for the future than organizations classified as analyzers. Analyzers are more likely than defenders to have the higher levels noted.

Given defenders' emphasis on protecting existing product-market domains, prospectors' interest in actively exploring areas of potential high growth, and analyzers' in-between position, we also expected there to be differences in the service portfolios of each type (Henderson, 1973). Specifically,

> Hypothesis 2: Organizations classified as defenders will have the lowest percentage of their services in high-growth areas and prospectors will have the highest percentage in high-growth areas. Analyzers will occupy an intermediate position.

A particularly strong test of the validity of the typology's measures is their ability to predict differences in behavior in regard to organizations' traditional business lines. The question is whether, even in their core businesses, prospectors have a more active market orientation than analyzers, who in turn have a more active orientation than defenders.

> *Hypothesis 3: Organizations classified as prospectors will emphasize new market and new service development strategies in their core business more than analyzers, who in turn will emphasize such strategies more than defenders.*

The relationship between intended and realized strategies (Mintzberg, 1978) was also of interest to us. Because organizations need time to implement a given strategy, adopting a strategy might not always yield immediate effects. To allow for this possibility, we conducted two tests of predictive validity examining the relationship between an organization's strategic orientation at one point in time and behavior two years later:

> *Hypothesis 4: Organizations classified as prospectors are likely to (a) offer a greater number of diversified services two years after data are first collected and (b) initiate more new diversified services over the two-year period than analyzers. Analyzers will have higher levels than defenders.*

To date, researchers have given the entrepreneurial dimension of Miles and Snow's typology more attention than the other dimensions (Luther & Rescho, 1987; Zahra, 1990). We also tested the validity of the administrative dimension, examining various measures of the strategic planning process associated with the Miles and Snow's strategic orientations: the formality of the planning process, the innovativeness of the plans developed, and the perceived quality and importance of market research in an organization.

Given their emphasis on stability and efficiency in protecting their core business and their need for predictability (Miles & Snow, 1978: 44), defenders should score highest on planning process formality, followed by analyzers and prospectors. Prospectors should score lowest because of the difficulty involved in formalizing the planning process in organizations whose products, markets, and technologies change frequently. Prospectors should need a looser, more informal process to allow them to innovate and explore new opportunities as they arise (Ansoff, 1934). Thus,

> *Hypothesis 5: Organizations classified as defenders will score the highest of the three types studied on planning process formality, followed by analyzers and prospectors.*

In regard to the innovativeness of plans, prospectors, with their orientation toward capturing first mover advantages, should score the highest, followed by analyzers and defenders. We expected defenders, with their orientation toward internal efficiencies and protecting their core business, to give the least emphasis to innovativeness. Thus,

> *Hypothesis 6: Organizations classified as prospectors will
> score the highest of the three types studied on planning
> innovativeness, followed by analyzers and defenders.*

Because prospectors must continually scan their external environment to locate and exploit new product-market opportunities (Walker & Ruekert, 1987), we expected that, of the three types studied, they would give the greatest attention to market research. Prospectors also have the greatest need to monitor a wide range of environmental conditions, trends, and events (Miles & Snow, 1978). Although analyzers and defenders also need market research, it is generally more narrowly focused and requires less investment than that of prospectors. Hence,

> *Hypothesis 7: Organizations classified as prospectors will
> make the strongest market research efforts of the three
> types studied, followed by analyzers and defenders.*

DATA AND METHODS

Data on strategic orientation according to Miles and Snow's typology were collected as part of a large-scale study of the strategic adaptation responses of 574 hospitals. We collected data both in 1984–85 and in 1986–87 in order to assess changes in strategic orientation over time.

Two major types of data were collected: perceptual and archival. The first major source of the perceptual data was a questionnaire on stratetic planning self-administered by each hospital's chief executive officer (CEO), to whom we mailed it. The completion rate was 94 percent in 1984 and 87 percent in 1987. We also gathered perceptual data in one-to-two hour interviews with 140 corporate office individuals, including board chairmen, CEOs, and vice presidents for strategic planning, finance, marketing, human resources, and related functional areas. The major sources of the archival data were an inventory of services provided by each hospital and additional services data from the American Hospital Association. Each hospital belonged to one of eight hospital systems, which included both investor-owned and not-for-profit hospitals. The hospitals were located in 45 states in urban (31.2%), suburban (20.3%), semisuburban (25.4%), and rural (23%) areas. They had an average of 180 beds, with a range of 21 to 873. Where appropriate, we adjusted data for hospital bed size.

Multiple indicators of strategy were developed at both the organizational and business-unit levels.[2] Further details appear in the Appendix. The perceptual measures derived from the strategic planning questionnaire in-

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[2] Organizational level refers to organizations' overall strategies and business level to strategies on specific hospital services such as general inpatient surgical care, general inpatient obstetrics care, ambulatory surgery, long-term care, and home health care. These service lines are analogous to product lines in other industries, and at the time of the study some hospitals had organized them around strategic business units.

cluded CEOs' assessments of (1) their organizations' overall strategic orientation on a scale of 1 (defender) to 7 (prospector), with one and two collapsed into the category of defenders, three to five collapsed as analyzers, and six and seven collapsed as prospectors; (2) the degree of emphasis given to new market and new service development activity for each of 15 specific service lines, including 5 core business services (acute inpatient surgical care, medical care, obstetrics care, pediatrics care, and psychiatric care) and 10 noncore (diversified) services; (3) assessment of the market growth potential of each of the 15 service lines; and (4) the perceived quality of the strategic planning process in terms of formality, innovativeness, and market research capability. We gathered information on the planning process only in the second collection of data. The first three measures reflect the entrepreneurial dimension of the typology, and the others reflect the administrative dimension (Luther & Rescho, 1987).

Following previous research (Hambrick, 1981; Snow & Hrebiniak, 1980), we used CEOs as our key informants for assessing the organizations' overall strategic orientations since they were the most knowledgeable about each hospital's strategies, market emphasis, and planning processes. We asked CEOs to consult, if necessary, with such key staff members as planning and marketing specialists, executive vice presidents, and associate administrators when assessing market-growth potential. Pretest administration of the instrument and follow-up phone interviews confirmed that many executives consulted such staff members on specific service-level strategies concerning market share and market growth. Three pages separated the self-typing question about CEOs' perceptions of their organizations' overall strategic orientations from the new market-new service development question; six pages separated it from the market-growth assessment questions; and five pages separated it from the strategic planning process questions.

The archival measures included (1) the number of diversified services offered, selected from a 34-item services inventory (involving such services as home health care, outpatient diagnostic services, geriatric screening, health promotion, and sports medicine); (2 the number of these diversified services added in the past two years; (3) the number of these services planned; (4) the number of high-technology services offered (data came from the American Hospital Association); and (5) the ratio of outpatient to inpatient services offered.

The reliability of the self-typing measure was assessed through a test-retest approach involving 19 hospital CEOs. About two weeks after we received their initial assessments, we telephoned these CEOs and once again asked for their evaluation of their organization's strategic orientation, using exactly the same definition as the original self-administered instrument. There was agreement within one point on the seven-point scale in 71 percent of the cases. For new services and new market development, there was exact agreement in 69 percent of the cases. The market growth measure showed agreement within one category in 82 percent of the cases.

Additional data were obtained from 74 corporate office executives of the

eight hospital systems regarding their assessments of the corporation's over-all strategies and of their hospitals as a group. For these assessments, we used an index of concentration developed by Ray and Singer (1973) as a measure of interrater reliability for nominal categories for the strategic self-typing and perceived new market-new service development strategies. We used James, DeMaree, and Wolfe's (1984) measure of overall interrater reliability for ordinal data to assess perceived market growth.

The average overall concentration measure for the 74 corporate-office strategic orientation ratings was .52, with a range of .30 to .76.[3] For new service and new market development strategies, the average concentration measure over all respondents and services was .47, with a range of from .38 to .65. For perceived market growth, the overall interrater reliability was .96, with reliabilities for each corporation above .90. Individual service item reliabilities ranged from .32 to .81, with most above .70. Cronbach's alpha based on a test-retest of respondents from six corporations was .92. In gen-eral, these data indicate moderate reliability for the strategic orientation and new service-new market development measures and strong reliability for the market-growth measures.

From a factor analysis of 19 items related to the planning process, we obtained four measures of formality: agreement on goals, degree of formal-ization and discipline, degree of plan development, and extent of depart-ment directors' and division heads' involvement in planning. All four items had factor loadings above .50 and eigenvalues above 1.0 derived from prin-cipal components analysis with varimax rotation. Innovativeness was mea-sured by two items: degree of innovativeness compared to past strategies and degree of innovativeness compared with competitors; factor loadings were above .60, eigenvalues above 1.0. Market research also had two items: the quality of market research and the ability to obtain market research in-formation; factor loadings were above .70, and eigenvalues were greater than 1.0.

The validity of the measures was examined through one-way analysis of variance using Duncan's multiple range test to examine differences between all combinations of groups. We gave primary attention to assessing the va-lidity of the CEOs' self-typing of strategic orientations with the archival and other perceptual measures previously discussed. Overall, there were 95 prospectors, 321 analyzers, and 31 defenders in the first data collected and 104 prospectors, 268 analyzers, and 35 defenders in the second collection.

RESULTS

Table 1 presents the means, standard deviations, and correlations for all variables for both waves of data collection. Not surprisingly, the overall

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[3] Although there is no commonly accepted cutoff criterion for evaluating this concentration measure, a score of .50 or above indicates a reasonable degree of concentration into nominal categories.

TABLE 1
Means, Standard Deviations, and Correlations

Variables	Waves of Data Collection	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Strategic orientation	1	1.86	0.88											
	2	1.88	0.93											
2. Diversified services	1	7.41	4.61	.05										
	2	9.40	4.60	.04	.41*									
3. Diversified services added in past two years	1	2.67	2.31	.07	.63*	.06								
	2	2.66	2.30	.02	.03	.05	.13*							
4. Planned diversified services	1	2.36	2.86	.02	−.01	.03	.05							
	2	1.23	1.95	.03	.05	.08	.01	.03						
5. Overall emphasis on new services and markets	1	39.46	16.64	.13*	.10*	.04	.14*	.05						
	2	36.55	13.67	.14*	.00	−.04	.07	.82*	.02					
6. Percentage of high-growth services	1	74.1%	20.7	.10*	−.14*	.04	.04	.93*	.02					
	2	43.9%	29.8	.11*	.06	.07	−.09*	.06	.05	.07				
7. Emphasis on new services and new markets	1	33.66	17.37	.14*	.09*	.05	.01	.04	−.04	.07				
	2	34.83	15.22	.12*	−.02	.08	.01	.15*	.10*	.15*				
8. Planning formality	2	3.06	0.70	.08	.04	.07	.13*	.16*	.09*	.15*				
9. Planning innovativeness	2	3.59	0.77	.06	.01	.12*	−.06	.05	.08	.02				
10. Market research	2	2.77	0.92	.12*	.11*	.01	−.05	.01	−.03	−.01				
11. Ratio of outpatient to inpatient services	1	0.79	0.46	.09*	.03	−.01	.17*	.10*	.10*	.03	.22*	.11*		
	2	0.84	0.43	.03	.04	.16*	.15*	.08	.16*	.04	.19*	.05	.08	.00
12. High-technology services	1	3.52	2.33	−.07	.19*	.16*	.05	.09*	−.02	.12*	.09*	.05	.08	.00
	2	3.48	2.28	.06	.13*	.02	.03	.10*	−.09*	.11*	−.01	.06	−.05	.05

number of diversified services offered is positively and significantly corre-
lated with the number of new services started in recent years, as is the degree
of emphasis on overall new service-new market development with the de-
gree of emphasis on new service-new market development for core business
services only. The correlations among all other variables are generally low.[4]

The findings reported in Table 2 support the predicted ordering of pros-
pectors, analyzers, and defenders in regard to (1) the emphasis given to new
service and new market development activities, (2) the number of diversified
services offered, adjusted for hospital bed size, (3) the number of diversified
services started in the two years preceding data collection, (4) the ratio of
outpatient to inpatient services offered, (5) the number of high-technology
services offered, adjusted for hospital bed size, and (6) the number of new
diversified services planned for the future. These results are consistent for
both waves of data, with one exception, the number of diversified services
started in the past two years. Thus, there is consistent support for the first
hypothesis regarding the ordering of the three strategic types in regard to
both new service and new market development and service diversification.

Table 2 also provides data relevant to the hospitals' overall portfolios of
services (Henderson, 1973). Consistent with the second hypothesis, defend-
ers have the lowest percentage of services in high-growth areas, followed by
analyzers and, finally, by prospectors. These findings are consistent for both
waves of data collection.

The data shown in Table 2 also support the third hypothesis. Specifi-
cally, even in the core business lines—the five traditional acute inpatient
care services—prospectors give greater emphasis to new service and new
market development than analyzers who, in turn, give greater emphasis to
such activities than defenders. Once again, the findings are consistent for
both waves of data collection.

Table 2 also provides evidence for the prospector-analyzer-defender or-
dering suggested by the fourth hypothesis. Specifically, prospectors were
likely (1) to be providing a greater number of diversified services at the time
of the second data collection, and (2) to have initiated a greater number of
such services over the interval between collections than analyzers. Analyz-
ers were more likely to have higher values than defenders. These results
represent a predictive validity test that takes into account the possible time
lag effects between intended and realized strategies (Mintzberg, 1978).[5]

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[4] When the full 1-to-7 strategic orientation scale is used rather than the collapsed categories
(defender = 1, analyzer = 2, prospector = 3), the number of significant correlations with the
archival measures increases.

[5] The small number of defender firms limited our ability to conduct additional time lag
tests comparing intended strategy for two years in the future and actual future behavior. We
were able to analyze the number of new services planned and the number of high-tech services
provided. In the first, prospectors planned significantly more new services than analyzers (1.13
vs. .73, $F = 3.26$, $p < .04$), but there were no significant differences between prospectors and
defenders or analyzers and defenders. In the second case, prospectors provided significantly

TABLE 2
Results of Validit7 Tests[a]

Variables	Waves of Data Collection	Prospectors	Analyzers	Defenders	N	F
Entrepreneurial component						
Overall emphasis on	1	46.50[e]	37.50[e]	26.41[e]	446	21.68***
new services and		(14.62)	(16.50)	(12.48)		
markets	2	39.52[e]	36.27[e]	29.69[e]	406	6.99***
		(12.03)	(13.59)	(16.50)		
Diversified services[b]	1	7.88[h]	7.13	5.79	415	2.34†
		(4.30)	(4.40)	(6.07)		
	2	10.03[h]	9.27	7.96	393	2.66†
		(4.60)	(4.70)	(4.60)		
Diversified services	1	3.13[f]	2.70[f]	1.50	343	3.38*
added in past two years		(2.92)	(2.32)	(1.34)		
	2	4.16	3.93	3.38	393	0.93
		(2.72)	(3.00)	(2.84)		
Ratio of outpatient	1	0.92[e]	0.77[e]	0.60[e]	444	7.39***
to inpatient services		(0.47)	(0.44)	(0.38)		
	2	0.90[f]	0.84[f]	0.65	406	4.39**
		(0.46)	(0.43)	(0.30)		
High-technology	1	2.57[e]	2.10[e]	1.31[e]	447	6.47**
services[b]		(2.18)	(1.62)	(1.45)		
	2	2.84[f]	2.45[f]	1.82	407	4.77**
		(1.68)	(1.79)	(1.56)		
Planned diversified	1	2.97[g]	2.05	1.71	446	4.19**
services		(3.46)	(2.60)	(3.78)		
	2	1.60[g]	1.10	0.74	406	3.12*
		(2.50)	(1.92)	(1.40)		
Percentage of	1	58.4%[f]	55.5%[f]	43.9%	446	2.83†
high-growth services		(26.1)	(30.0)	(34.1)		
	2	52.6%[e]	44.6%[e]	30.8%[e]	406	7.01***
		(28.8)	(31.2)	(30.2)		
Emphasis on new	1	39.81[e]	32.38[e]	21.57[e]	446	15.35***
services and new		(15.18)	(17.35)	(13.93)		
markets for core services[c]	2	38.45[g]	34.16	29.01	406	5.82**
		(14.36)	(14.98)	(17.41)		
Diversified services	1	8.40[f]	7.52[f]	6.45	435	4.59**
two years in future[b]		(3.41)	(4.55)	(4.23)		
	2	10.94[e]	9.20[e]	6.16[e]	354	9.95***
		(5.23)	(4.34)	(3.18)		
New services offered	1	3.55[f]	2.91[f]	2.28	355	4.90**
in most recent		(3.03)	(2.52)	(1.89)		
two years	2	4.39[f]	3.91[f]	2.20	354	4.85**
		(2.86)	(2.85)	(1.76)		

TABLE 2 (continued)

Variables	Waves of Data Collection	Prospectors	Analyzers	Defenders	N	F
High-technology services offered by intended strategic orientation	1	3.24[g]	2.78	1.00	475	4.05*
		(2.64)	(2.27)	(2.45)		
	2	—				
Diversified services planned by intended strategic orientation	1	1.14[i]	0.73	0.83	475	3.26*
		(1.99)	(1.45)	(2.04)		
	2	—				
Administrative component[d]						
Planning formality	1	—				
	2	3.20[f]	3.05[f]	2.69	406	7.14***
		(0.79)	(0.64)	(0.70)		
Planning innovativeness	1	—				
	2	3.91[e]	3.48[e]	2.87[e]	406	29.16***
		(0.66)	(0.72)	(0.93)		
Market research	1	—				
	2	3.00[f]	2.79[f]	2.33		7.19***
		(0.98)	(0.87)	(0.97)		

[a] The results are based on ANOVA and Duncan multiple range tests; standard deviations are in parentheses.

[b] We adjusted values for hospital bed size.

[c] This variable was measured on a scale of 0 to 100 points.

[d] Administrative variables were measured on a 1 to 5 scale (1 = low, 5 = high).

[e] All groups significantly differ at $p < .05$.

[f] Prospectors and analyzers significantly differ from defenders at $p < .05$.

[g] Prospectors significantly differ from analyzers and defenders at $p < .05$.

[h] Prospectors significantly differ from defenders at $p < .05$.

[i] Prospectors significantly differ from analyzers at $p < .05$.

   † $p < .10$

   * $p < .05$

  ** $p < .01$

 *** $p < .001$

Finally, Table 2 summarizes the findings pertaining to Hypotheses 5 through 7 regarding the administrative component measures of the Miles and Snow typology. Findings support the predicted prospector-analyzer-defender ordering for both planning innovativeness and market research. However, findings do not support that ordering in regard to planning process formality: prospectors and analyzers score significantly higher on planning process formality than defenders.

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more high-tech services than analyzers and defenders (3.24 vs. 2.78 and 1.0, respectively, $F = 4.16$, $p < .02$), but the difference between analyzers and defenders was not statistically significant.

Overall, the results of 25 of the 26 ANOVAs are significant at the $p < .10$ level or better and 22 of the 26 are significant at the $p < .05$ level or better. Duncan's multiple range tests indicate one or more significant predicted differences in 25 of 26 cases: in 8 cases all two-way comparisons are significant; in 12, prospectors and analyzers significantly differ from defenders; in 3, prospectors significantly differ from analyzers and defenders; and in 2, prospectors significantly differ from defenders. In particular, there are clear and consistent differences between prospectors and defenders and between analyzers and defenders. Findings reveal prospectors and analyzers to be more similar to each other than either is to defenders; 16 of 28 comparisons show no significant differences between them, although prospectors score consistently higher than analyzers on the various measures.

DISCUSSION

Overall, the results provide strong support for the measurement validity of Miles and Snow's (1978) strategic types. Of 26 analyses of variance using two sets of data from a three-year period, 24 are significant in the predicted ordering. For one of the two exceptions—the number of new diversified services offered in the two years preceding the second set of data—results are in the predicted direction, but the overall differences are not statistically significant. Between the two data collections, all the hospitals studied increased their diversified service offerings in response to pressures to contain inpatient costs, but the increase was greatest for defenders. Interviews with hospital executives suggested that a pure defender strategy was difficult to maintain in the rapidly changing health care environment, circumstances necessitating an increased emphasis on diversification.

The second exception involves planning process formality, in which, contrary to prediction, prospectors and analyzers scored higher than defenders. Others (e.g., Simons, 1987) have found similar results suggesting that prospectors may require a more formal planning system than other strategic types to improve their responses to new market opportunities. In Table 2, planning formality and innovativeness have a positive association ($r = .22$), a finding consistent with the argument that the purpose of a planning system is to facilitate sensing new market opportunities and taking appropriate action. For example, in an interview one planner from a prospector hospital commented, "Our planning system provides the basis for deciding what new markets to pursue. We don't go through a rigorous process every year, but the system is basically established to draw on." This suggests that formality should not be considered synonymous with a rigidity that might restrict the ability of prospectors to respond to a quickly changing market.

Overall, the findings fill an important gap in the literature, for they represent the first systematic attempt to validate measures of both the entrepreneurial and administrative components of the Miles and Snow typology. It is of particular interest that the findings support the validity of CEOs' self-typing of organizations' strategic orientations. It appears that using

knowledgeable key informants' perceptions of an organization's strategic orientation is a valid approach to measuring strategy. Ideally, researchers should use self-typing data with archival data to obtain a reasonably complete description of a given firm's strategy.

The results are also substantively robust across three different aspects of strategic behavior: (1) intended versus realized diversification of services (Mintzberg, 1978), (2) overall portfolio of services offered (Henderson, 1973), and (3) market strategies regarding traditional core business offerings. The findings pertaining to the number of new services offered support Hambrick's (1983) interpretation of the typology in terms of the rate at which new markets and new products are developed. Thus, the strategic types appear able to withstand the somewhat different interpretations of their underlying dimensions found in the existing literature.

The reliability and validity tests conducted in this study are based on data from a rapidly changing industry. To the extent that it is especially difficult to test the validity of strategic orientation constructs in a rapidly changing environment, the present analysis represents a particularly strong test of the typology's measures.

Although the present findings support the validity of this study's measures of the typology, additional work is needed in at least three areas. First, researchers need to know more about the reactor strategy and its measurement. In the present study, organizations categorized as reactors were typically most like analyzers and least like defenders. However, interview data suggested that reactors were not nearly as deliberate or systematic as analyzers. For example, one reactor executive described his hospital's strategic behavior as like "an outbreak of measles." Another commented, "There isn't much staff analysis of strategies."

Also, although the present study examined several aspects of the administrative dimension, additional aspects deserve study. The technical domain, which was not a part of the current study, also requires examination. Establishing the validity of measures of this component in addition to the entrepreneurial and administrative components will add further utility to the typology.

Finally, additional assessment of the predictive validity of the typology is needed. What behavior should we expect of prospectors, analyzers, defenders, and reactors? Will a prospector move more aggressively against a new competitor than a defender? Are prospectors and analyzers likely to adopt an innovation earlier than defenders? Does this timing depend on the type of innovation? Perhaps prospectors are more likely to be early adopters of *programmatic* innovations like new products or services, analyzers more likely to be early adopters of *managerial* innovations (for example, a new management information system), and defenders more likely to be early adopters of *technical* innovations like a new production technology. Attention to these issues will further understanding of the typology. In general, the present findings suggest that perceptual measures are congruent with archival measures of Miles and Snow's strategic types and that researchers can

use the typology with increased confidence in future work on organizations and their strategies.

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APPENDIX
Indicators of Strategy

Strategic Orientation Self-typing

All respondents were asked to place their hospital on this scale:

<div align="center">

A   B   C

low change 1, 2, 3, 4, 5, 6, 7 high change   D

</div>

considering how they currently operated, how they operated two years ago, and how they were likely to operate two years in the future. We provided the following definitions of the letter anchors:

"Hospital A maintains a 'niche' within the health care system by offering a relatively stable set of services/facilities. Generally Hospital A is not at the forefront of new services or market developments in healthcare. It tends to ignore changes that have no direct impact on current areas of operation and concentrates instead on doing the best job possible in its existing arena."

"Hospital B maintains a relatively stable base of services while at the same time moving to meet selected, promising new service/market developments. The hospital is seldom 'first in' with new services or facilities. However, by carefully monitoring the actions of institutions like Hospital C (below), Hospital B attempts to follow with a more cost-efficient or well-conceived service."

"Hospital C makes relatively frequent changes in (especially additions to) its set of services/facilities. It consistently attempts to pioneer by being 'first in' in new areas of service or market activity, even if not all of these efforts ultimately prove to be highly successful. Hospital C responds rapidly to early signals of market needs or opportunities."

"Hospital D cannot be clearly characterized in terms of its approach to changing its services or markets. It doesn't have a consistent pattern on this dimension. Sometimes the hospital will be an early entrant into new fields of opportunity, sometimes it will move into new fields only after considerable evidence of potential success, sometimes it will not make service/market changes unless forced to by external changes."

We classified hospitals with responses of 1 or 2 as defenders; those with 3 to 5, as analyzers; and those with 6 or 7, as prospectors.

New Service-New Market Development

For each of 15 services, ranging from general inpatient medical and surgical care to outpatient renal dialysis and health promotion, respondents assigned points from 0 to 100 (the total was to add to 100) across four categories defined as follows:

1. *"Further penetrate current markets*—Attempting to attract a greater number of patients from markets which you currently serve with the service."
2. *"Develop new markets*—Developing new markets for the service which you currently offer; going beyond the markets which you currently serve."

3. "*Refine current services*—Improving or in some way modifying the characteristics of the services which you currently offer; for example, upgrading staffing or updating equipment."
4. "*Develop new services*—Starting new programs or services which your hospital did not previously provide."

Market Growth

For each of the 15 services, respondents indicated the potential percentage of growth in the volume of patients seen or services provided using the following scale:

1. "*No growth potential*—Service may actually be declining."
2. "*Low growth potential*—Between 1% and 10% per year."
3. "*Moderate growth potential*—Between 11% and 50% per year."
4. "*High growth potential*—greater than 50% per year."
5. "We do not offer this service."

Services Inventory

The services inventory diversification list included 34 services. Examples were ambulatory care, geriatric care, health promotion, home health-extended care, outpatient diagnostic services, and service delivery alternatives such as health maintenance organizations and preferred provider organizations.

High-technology Services

The list included 15 services ranging from intensive care units to nuclear magnetic resonance imaging and various organ and tissue transplant services.

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INFLUENCE OF SPEED OF THIRD-PARTY INTERVENTION AND OUTCOME ON NEGOTIATOR AND CONSTITUENT FAIRNESS JUDGMENTS

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Using a simulated organizational dispute, we tested the impact of a third-party's intervention on disputants' perceptions of procedural and distributive justice and satisfaction with the third party. We manipulated disputants' roles in the negotiation, the speed of third-party intervention, and the outcome imposed by the third party in a two-by-two-by-five factorial design. The results suggest that the speed of third-party intervention influenced perceptions of procedures more than perceptions of outcomes. Speed of intervention also influenced disputants differently depending on their role. Outcome influenced all measures of procedural and distributive fairness. We discuss implications for managerial behavior in dispute resolution and consequences for the measurement of procedural justice.

Research on dispute resolution and resource allocation has identified two dimensions of fairness that are important to participants in disputes. Early research focused on distributive justice, or equity, the perceived fairness of the outcomes of a dispute. More recently, researchers have studied procedural justice, which is the perceived fairness of the procedures used to generate outcomes. The present study examined the influence of the speed of third-party intervention on disputants' perceptions of distributive and procedural justice.

Researchers have advanced theories of procedural justice based on work in legal (Thibaut & Walker, 1975, 1978) and organizational settings (Leventhal, Karuza, & Fry, 1980). In their theory of procedure, Thibaut and Walker distinguished between process control, or the degree to which disputants exerted influence over a resolution procedure, and decision control, or the degree to which disputants exerted influence over the final outcome of a dispute. Leventhal and colleagues' allocation preference theory identified a number of dimensions that influenced procedural justice, many of which overlapped with the dimensions Thibaut and Walker iden-

tified (Lind & Tyler, 1988). Researchers investigating procedural justice in organizations have examined performance evaluation and job transfers (Lissak, 1983), pay raise decisions (Folger & Konovsky, 1989), and dispute resolution (Karambayya & Brett, 1989; Sheppard, 1984; Sheppard & Lewicki, 1987). Many of the same effects found in legal contexts have also occurred in organizational contexts: for example, in both laboratory and field settings, people have seen performance evaluation procedures that provide a high level of voice, or personal expression (a component of process control), as more fair than procedures that limit input (cf. Lind & Tyler, 1988).

Some recent studies have suggested that the manner in which a procedure is enacted or interpreted plays an important role in subsequent evaluations of fairness. For example, using concepts found in research on leadership, Ross, Conlon, and Lind (1990) found that disputants involved with task-oriented mediators were more satisfied with mediation when the deadline for a settlement was vague rather than explicit. Disputants involved with person-oriented mediators were equally satisfied whether the deadline was known or not. A similar pattern was found for disputants' distributive fairness ratings.

Ross and colleagues (1990) were the first to examine variation within a mediation procedure by varying the behavioral style of third parties. As Sheppard (1984) noted, there has been little research on disputants' reactions to variation within a procedure. Assuming that other variations in enactment may influence participants' perceptions of distributive and procedural justice, we examined one such variable, the timing of third-party intervention.

As McGrath and Rotchford (1983) noted, time is a pervasive aspect of behavior in organizations. Time can also play a prominent role in negotiations: disputants often set deadlines for reaching agreements or stall before making a concession in the hope that opponents will concede first. Sheppard and Lewicki's (1987) study of 44 executives found that the timeliness of third-party intervention was an important aspect of fairness for managers. Views of negotiation put forth in previous research have suggested that, all thing being equal, people prefer procedures that can settle disputes quickly to those that cannot because the costs to all parties increase as time elapses (Ury, Brett, & Goldberg, 1988). But can a dispute be settled too quickly?

Previous views of distributive justice, social exchange, and public choice (e.g., Adams, 1965; Walster, Walster, & Berscheid, 1978) have suggested that satisfaction with procedures, outcomes, and third parties is primarily, if not exclusively, a function of outcomes; thus, whether a settlement is reached quickly or slowly is unimportant. On the other hand, procedural justice theory and research (e.g., Lind & Tyler, 1988) have suggested that the speed of third-party intervention could have a significant impact on disputants' perceptions by altering their opportunity to exercise voice. If a third party intervenes quickly in a procedure, it will allow little opportunity for disputants to express their opinions and may be seen as less fair than a longer procedure. In addition, disputants typically do not desire third-party

intervention unless they realize that they cannot resolve a dispute themselves (Pruitt, 1981), and this realization may not yet have occurred if intervention is fast. Lastly, Greenberg's (1990) work suggested that rapid intervention may not appear to be as fair because it violates people's expectations of what a fair procedure should be.

> Hypothesis 1: The quick imposition of an outcome by a
> third party will lead disputants to report low levels of
> procedural justice, distributive justice, and satisfaction
> with the third party.

The present study also varied the outcome third parties imposed on disputants. Although most of the research on legal procedures has focused on all-or-nothing outcomes, agreements in which both parties receive some amount of the resource in question are typical in organizations. Little previous research has examined variation in outcomes beyond total win and total loss.[1] The present study employed five different outcomes that varied parametrically in their favorability to subjects.

When maintaining social harmony is important, dividing rewards or outcomes equally among disputants is likely to be the preferred distribution norm, and individuals are likely to be uncomfortable with exceedingly large rewards gained at the expense of the other disputants (Greenberg, 1987; Walster et al., 1978). Thus,

> Hypothesis 2: Although outcome satisfaction will increase as the value of an outcome increases, disputants
> who are co-workers will not see excessively favorable outcomes as fair.

This study also examined perceptions of satisfaction and fairness for two types of disputants. We called disputants who participated in a dispute resolution procedure "negotiators" and called those who did not participate but were affected by an outcome "constituents." The relationship between constituents and negotiators is similar to the principal-agent relationship discussed in agency theory (e.g., Eisenhardt, 1988), as constituents delegate the work of negotiating to negotiators. Comparing these two types of disputants allowed us to compare two roles whose occupants have similar stakes in an outcome—though negotiators may also have other interests at stake, such as prestige. In addition, most organizational disputes, both labor negotiations and less formal procedures, involve only a few employees in negotiations; the others must wait to hear the outcome and do not experience the procedure firsthand. Thus, studying these two roles seemed of practical importance.

Procedural justice studies have rarely manipulated roles, typically comparing the reactions of participants in and observers of procedures (e.g., Latour, 1978). The literature on procedural justice and participation suggests that a high level of participation in properly enacted procedures enhances

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[1] Conlon, Lind, and Lissak (1989) is an exception.

perceptions of fairness, even when participants have no control over outcomes (Musante, Gilbert, & Thibaut, 1983)

> *Hypothesis 3: Negotiators will perceive themselves as having higher levels of control over decisions and voice than constituents.*

Although we expected negotiators to report greater voice and decision control than constituents, we expected constituents to see distributive justice, procedural accuracy, and third parties more favorably than negotiators because, lacking specific information about how a procedure was enacted, constituents will have an idealistic vision and assume that it was executed properly and competently. Negotiators, who personally experienced the behaviors of opponents and third parties, will have more negative perceptions.

> *Hypothesis 4: Constituents will report higher levels of distributive justice, procedural accuracy, and satisfaction with third parties than negotiators.*

Finally, role was expected to interact with the speed of third-party intervention. We expected negotiators' perceptions to vary with the speed with which an outcome was imposed because speed affects their opportunity for voice. Constituents, with no opportunity for voice in either case, should be unaffected.

> *Hypothesis 5: Constituents' perceptions of decision control, voice, and third-party propriety will show little variation related to the speed of third-party intervention. Negotiators' perceptions of these values will be lower under fast intervention than under slow intervention.*

METHODS

Subjects and Research Design

Subjects were 197 undergraduate business administration students who participated in return for class credit and a chance at several monetary prizes. We conducted simulations of an organizational negotiation for groups of 12 to 30 subjects. The study had a two-by-two-by-five factorial design. Subjects took the roles of disputants, either negotiators or constituents; third-party intervention in the dispute was either slow or fast; and the outcome received ranged from extremely unfavorable to extremely favorable. The number of subjects in the cells formed by these variations ranged from 8 to 10.

Procedures

Subjects were seated at personal computers that presented the instructions, experimental manipulations, and a questionnaire. Experimenters, who were blind to the assignment of subjects to experimental conditions, told subjects that they would be role-playing an organizational negotiation

and that they would interact with other subjects via the computer network. All subjects were told they had been randomly assigned to work in the organization's Boston office. Those assigned to be negotiators were given the role "Boston bargaining rep" and those assigned to be constituents were given the role "Boston sales manager." The instructions then said that the organization's Boston office was in conflict with its New York office and that the bargaining representative's task was to resolve the conflict with another manager, the New York bargaining representative. Subjects also learned that a third manager, the product manager, could assist them in settling the dispute.

The scenario was based on an actual negotiation that occurred in a large securities firm. The New York and Boston bargaining representatives negotiated three issues: the size of transferable accounts, eligibility for promotion, and criteria for promotion. Subjects received information about the issues on the computer screen and in a manila folder. Following past research (Carnevale & Conlon, 1988), we presented information about the issues on the screen in tabular form. The actual table used is in Carnevale and Conlon (1988).

For each issue, there were nine proposal levels labeled A to I. Subjects were told that the bargaining representatives needed to agree on one proposal level for each issue. Points shown next to each level indicated its value to the disputants. Level I gave the most points to subjects on every issue. Subjects saw both their own and their opponents' point values and were told that the product manager, the third party, would see both disputants' point values.

On each round of negotiation, the bargaining representatives first saw the New York representative's issue chart and a proposal composed of three letters. Subjects then saw their own issue chart and the personal outcomes associated with particular agreements. They were told that the points for outcomes would be converted to lottery tickets at the completion of the study and that the seven winning tickets would split $300. The instructions emphasized that chances increased as lottery tickets increased, so subjects should try to get as many points as possible.

Subjects were reminded that the product manager, who was described as superior in the organization's hierarchy to the managers in the New York and Boston offices, could intervene in the negotiation. We told them that although the product manager might not get involved in the negotiation at all, he could impose an outcome at any time. They were also told that the product manager had a history of acting fairly and responsibly in helping managers resolve conflicts.

For negotiators in all conditions, the proposals generated by the New York manager (the opponent) produced few points. When the third party was to intervene slowly, the opponent's proposals on the eight rounds of negotiation were labeled AAA, AAA, AAB, AAB, ABB, ABB, BAB, and BAB. When intervention was to be fast, the opponent's were AAA and BAB, the

same as the first and last offers made by the opponent when intervention was slow. Thus, negotiators' opponents conceded an equivalent amount in both conditions.

Negotiators were free to make counteroffers and send messages to their opponent on each round. When intervention was slow, the computer interrupted negotiators after their opponent's eighth proposal and told them that the third party had decided to impose a settlement. When intervention was fast, the interruption occurred after the opponent's second proposal. After receiving an outcome, subjects completed a questionnaire that elicited their perceptions of procedural and distributive justice, the third party, and the opponent. After they completed the questionnaire, we told subjects that the study was finished and gave them a debriefing.

Independent Variables

Disputant role. Negotiators, assigned the role of the Boston bargaining representative, were reminded that they were negotiating not only for themselves, but also for their co-worker, the Boston sales manager. In fact, we encouraged subjects to believe that many co-workers in the Boston office were depending on their negotiation skills. Constituents, assigned the role of the Boston sales manager, were told that another person in the room was their bargaining representative. During the negotiation, constituents were encouraged to review the material provided in their folders about the organization, the dispute, and the dispute resolution procedure. While constituents waited for the dispute to be settled, a message flashed on their computer screen: "PLEASE STAND BY: YOUR BARGAINING REP IS STILL NEGOTIATING."

Speed. The manipulation of third-party intervention varied how many rounds the bargaining representatives negotiated with their opponent before the third party imposed a settlement. Bargaining representatives in the fast intervention condition were interrupted before they made a proposal on the second round of negotiation and told that the third party had decided to impose a settlement. In pretests, subjects reached the second round in about two minutes. Constituents in the fast intervention condition were thus kept waiting for about two minutes before their computer screen announced that the third party had decided to settle the dispute during the second round of the negotiation. Bargaining representatives in the slow intervention condition were interrupted before they made a proposal on the eighth round of negotiation. Constituents in this condition waited about ten minutes for the announcement that the product manager had decided to settle the dispute, the amount of time negotiators in the slow intervention condition took to reach this point in pretests.

Outcome. In the zero outcome condition, subjects were told that the third party had imposed settlement AAA, which gave them no points but gave their opponent 240 points. In the one-quarter outcome condition, CCC was imposed, providing 60 points to a given subject and 180 to the opponent. In the one-half outcome condition, settlement EEE gave each disputant

120 points. In the three-quarters outcome condition, GGG gave 180 points to a subject and 60 to the opponent. In the everything outcome condition, III gave 240 points to a subject and no points to the opponent. Subjects were told to write their settlement and its point value on a card in their folder.

Dependent Variables

Subjects indicated their judgments about the fairness of the settlement and other perceptions on six- and seven-point rating scales for a number of measures that we constructed. A manipulation check for the speed of third-party intervention consisted of two questions asking how long it took the dispute to be resolved and how fast it was resolved ($\alpha = .76$). We measured outcome satisfaction with two questions that asked subjects how satisfied they were with the outcome of the dispute ($\alpha = .94$) and measured outcome fairness with two questions on how fair the outcome was ($\alpha = .89$).

Three indexes measured procedural justice. Decision control was measured by asking subjects how much control and how much influence they had over the decision that was made ($\alpha = .64$). We measured process control using two scales reflecting different components of the construct. Voice was measured by four questions: we asked for subjects' perceptions of their opportunity to present evidence and express their views and asked about their belief that adequate information exchange preceded the settlement and that the third party gave proper consideration to their views ($\alpha = .68$). Accuracy, a component of procedural justice (Leventhal et al., 1980), was measured by three questions addressing beliefs that the negotiation process was an accurate way to reach a solution and that the third party had adequate knowledge of each disputants' positions ($\alpha = .71$).

Finally, three indexes measured subjects' perceptions of the third party. Measures of satisfaction with the third party were five questions assessing subjects' satisfaction, trust, and resentment of the third party, their satisfaction with the third party's performance, and their willingness to talk to a manager superior to the third party to change their settlement ($\alpha = .87$). Third-party fairness was assessed with three questions measuring perceptions of the third party's fairness, lack of bias, and impartiality ($\alpha = .76$). Finally, we measured perceptions of the speed of intervention with an index called intervention propriety: three questions asked if the disputants had had a reasonable amount of time to settle the dispute themselves, whether they could have reached an agreement by themselves, and whether the third party's assistance was necessary to reach agreement ($\alpha = .66$). Table 1 shows means, standard deviations, and the intercorrelations among the measures.

RESULTS

Manipulation Checks

Subjects who received fast settlements reported that the dispute was resolved more quickly than did subjects who received settlements less

TABLE 1
Means, Standard Deviations, and Correlations

Variables	Means	s.d.	Correlations						
			1	2	3	4	5	6	7
Distributive justice									
1. Outcome satisfaction	3.19	2.07							
2. Outcome fairness	2.85	1.77	.7ε						
Procedural justice									
3. Decision control	1.53	0.85	.2ε	.30					
4. Voice	1.95	0.93	.3ε	.35	.54				
5. Accuracy of procedure	3.20	1.23	.42	.44	.14	.29			
Third-party									
6. Satisfaction	3.14	1.42	.78	.71	.27	.45	.61		
7. Fairness	2.91	1.40	.59	.73	.25	.40	.55	.74	
8. Propriety of intervention	2.87	0.65	.35	.40	.07[a]	.36	.34	.41	.35

[a] All correlations except this one are significant at $p < .05$.

quickly ($\bar{x} = 10.37$ and 6.78, $F_{1,177} = 130.68$, $p < .001$). Subjects who received none, one-fourth, one-half, three-fourths, or all of the points in dispute correctly identified the number of points that they received ($F_{4,177} = 211.17$, $p < .001$) and their opponents received ($F_{4,177} = 423.84$ $p < .001$). Using Newman-Keuls comparisons (Winer, 1971) set at the .05 level, we found all five levels of outcome for both questions to be significantly different from each other. Finally, negotiators correctly identified themselves as the Boston bargaining representative, and constituents identified themselves as the Boston sales manager ($\bar{x} = 3.96$ and 2.96, respectively, $F_{1,177} = 648.31$, $p < .001$).

It was possible that manipulating the speed of intervention would confound subjects' perceptions of how competitive or cooperative their opponent was, with opponents who moved from the first proposal to the last in two rounds rather than eight perceived as more cooperative. To examine this possibility, we used two questions measuring subjects' perceptions of their own and their opponent's competitiveness. There were no differences between subjects in the fast and slow intervention conditions in perceptions of their opponent's ($\bar{x} = 2.26$ and 2.07, $F_{1,177} = 1.00$, n.s.) or their own competitiveness ($\bar{x} = 2.86$ and 3.19, $F_{1,177} = 1.99$, n.s.), strong evidence that all subjects perceived equivalent amounts of competitiveness in the disputes.

Major Analyses

Multivariate analysis of variance (MANOVA) was used to examine the overall influences of the three factors. Significant main effects emerged for speed of intervention ($F_{1,177} = 8.36$, $p < .001$), role ($F_{1,177} = 23.43$, $p < .001$), and outcome ($F_{4,177} = 18.57$, $p < .001$) and for the role-by-speed ($F_{1,177} = 4.37$, $p < .001$) and outcome-by-role ($F_{4,177} = 2.15$, $p < .001$) interactions. We report the results of univariate follow-up tests next.

Speed of intervention. Hypothesis 1, which predicted that fast third-

party intervention would result in lower ratings of distributive justice, procedural justice, and satisfaction with the third party than slow intervention, received strong support, especially for the procedural justice and third-party measures (see Table 2). Subjects for whom the imposition of an outcome was slow believed that their settlement was slightly more fair than subjects receiving fast intervention, but this effect only approached significance ($p <$ .11). Regarding procedural justice, subjects who received fast impositions reported having less decision control and less voice than those who received slow impositions. Lastly, subjects who received fast impositions were less satisfied with the third party and believed the intervention to be less proper than subjects who received a slow imposition.

Outcome effects. The manipulation of outcome strongly influenced all results (see Table 2). Hypothesis 2, regarding distributive justice ratings, received strong support: ratings of outcome satisfaction increase as the level of outcome increases, but ratings of outcome fairness peak when subjects receive three-fourths of the points and then decline.

The outcome imposed also strongly influenced measures of procedural justice: subjects who received three-fourths or all of the points in dispute reported having greater decision control and voice than all other subjects. In addition, subjects who received at least half the points in dispute perceived the procedure as more accurate than those receiving one-fourth, and the latter saw the procedure as more accurate than did subjects who received no points.

Finally, outcome influenced perceptions of the third party: as outcomes improved, satisfaction with the third party increased. Again, as with the outcome fairness and procedural accuracy measures, all subjects who received at least half the points in dispute believed the third party was equally fair, and these three groups reported greater third-party fairness than subjects in the remaining two conditions. Subjects who received at least half the points in dispute believed that the third party's intervention was more appropriate than subjects who received one-fourth, and the latter believed the intervention was more appropriate than did subjects who received no points.

Negotiators versus constituents. Role in the negotiation influenced a wide variety of measures (see Table 2). Hypothesis 3 received strong support, with negotiators seeing themselves as having greater decision control and more voice than constituents. Hypothesis 4 also received strong support, with outcome satisfaction higher for constituents than negotiators. Constituents believed that the procedure was more accurate than did negotiators, and the former were also more satisfied with the third party and believed the third party was more fair than did the negotiators.

The role manipulation was also involved in several significant interactions. As predicted in Hypothesis 5, the interaction of the role and speed manipulations influenced three variables. Constituents' perceptions of decision control ($F_{4,177} = 6.63$, $p < .011$) and voice ($F_{4,177} = 22.32$, $p < .001$) were not strongly influenced by the speed of intervention: means were 1.15

TABLE 2
Main Effects for the Three Manipulations[a]

Measures	Intervention			Disputant Role			Outcome Imposed					
	Fast	Slow	F	Negotiator	Constituent	F	Zero	One-quarter	One-half	Three-quarters	All	F
Outcome satisfaction	3.12	3.26	0.10	3.03	3.36	3.66†	1.12_a	1.25_a	3.08_b	4.84_c	5.78_d	223.41***
Outcome fairness	2.67	3.02	2.70	2.72	2.98	1.38	1.12_a	1.55_a	3.53_b	4.34_c	3.83_b	57.40***
Decision control	1.35	1.68	9.95**	1.87	1.17	52.35***	1.22_a	1.28_a	1.49_a	1.99_b	1.67_b	5.96***
Voice	1.59	2.29	50.27***	2.28	1.62	50.86***	1.52_a	1.66_a	1.82_a	2.29_b	2.47_b	9.00***
Accuracy of procedure	3.16	3.23	0.05	2.96	3.43	8.25**	2.25_a	3.07_b	3.29_c	3.61_c	3.83_c	12.23***
Satisfaction with third party	2.89	3.38	10.37**	2.87	3.42	14.33***	1.70_a	2.40_h	3.18_a	4.11_d	4.41_d	53.43***
Fairness of third party	2.82	3.00	0.66	2.77	3.05	3.02†	1.43_a	2.31_b	3.71_c	3.73_c	3.50_c	37.67***
Propriety of intervention	2.23	3.08	51.30***	2.64	2.70	0.20	1.88_a	2.35_b	3.26_c	3.28_c	2.97_c	14.20***

[a] For the speed of intervention and role manipulations, $df = 1, 177$; for the outcome manipulation, $df = 4, 177$. For the outcome manipulation, means in the same row with different subscripts are significantly different at the .05 level under Newman-Keuls comparisons.

† $p < .10$
** $p < .01$
*** $p < .001$

and 1.20, respectively, for the decision control index and 1.51 and 1.72 for the voice index. However, negotiators' perceptions of decision control and voice were much lower under fast intervention than under slow intervention ($\bar{x}$ = 1.56 and 2.17, decision control, and 1.72 and 2.83, voice). The interaction also influenced perceptions of the propriety of the third party's intervention ($F_{4,177}$ = 10.96, p < .001). Of the four types of subjects yielded by the interaction, negotiators under slow intervention perceived the third party's behavior to be most appropriate ($\bar{x}$ = 3.24), and negotiators under fast intervention perceived it as least appropriate ($\bar{x}$ = 1.99). Constituents' perceptions of impropriety in the slow and fast interventions were between these two extremes ($\bar{x}$ = 2.92 and 2.47).

The outcome-by-role interaction indicated that negotiators generally see themselves as having more decision control than constituents, except when they receive only one-fourth of the points in dispute ($F_{4,177}$ = 4.79, p < .001). In addition, although the perceived level of voice increases for both negotiators and constituents as the rewards yielded by an outcome increase, the level for constituents declines at the upper end of the outcome range but the level for negotiators continues to increase ($F_{4,177}$ = 3.94, p < .004). We did not predict these outcome-by-role interactions.

DISCUSSION

The hypotheses guiding this research received strong support. When a third party intervened quickly in a dispute, disputants reported low perceived decision control and voice. Compared to disputants whose third party intervened later, they were also much less satisfied with the third party and perceived the intervention as less appropriate. The speed of third-party intervention did not strongly influence perceptions of distributive justice.

A common assumption in research on dispute resolution is that it is beneficial to end conflicts as quickly as possible because protracted disputes raise the costs incurred by both sides. Prolonged disputes can also lead to the escalation of a conflict. Pruitt and Rubin described the course that conflicts can take over time: "First, relatively light, friendly, and inoffensive contentious tactics tend to give way to heavier moves . . . the number of issues in conflict tends to increase . . . a focus on specifics tends to give way to more global, all-encompassing concerns . . . motivation in escalating conflict shifts from an initial interest in doing well for oneself to beating the other side" (1986: 7).

Although we are not suggesting that managers ignore disputes until this "conflict spiral" is out of control, the present results suggest that it may be valuable to let subordinates in conflict wrangle with each other for a while before intervening. Having had adequate uninterrupted time to express their opinions, disputants will be more amenable to third-party suggestions and, if they are necessary, third-party settlements. Thus, despite pressures that may force managers to act quickly and decisively in organizational disputes, they must be careful that their haste to resolve conflicts does not result in

disputants feeling that their rights to due process have been violated. Previous research in political contexts has documented that when disputants see procedural fairness as low, they typically report low satisfaction and commitment to their institutions and representatives (Lind & Tyler, 1988). Those findings suggest that procedures enacted too quickly may lower organizational commitment among employees.

In addition, the present data clearly indicate that swift third-party intervention affects negotiators' procedural fairness judgments more negatively than it affects those of constituents. Negotiators, with their greater potential for using voice, were more affected by curtailment of their opportunity to express opinions than were constituents, who did not have this opportunity for voice no matter how long or short the negotiation was.

These findings suggest that negotiators are more likely to suffer low satisfaction and commitment than constituents. However, agents often serve as interpreters for principals: upon dispute settlement, negotiators communicate their feelings and perspectives to their constituents, who are likely to be starved for information regarding how the procedure was enacted. Clearly, the explanations a third party gives to justify intervention can have a powerful role in determining disputants' perceptions of satisfaction and fairness, and such explanations were not made in our study. In fact, the type of explanation a third party provides can attenuate or exacerbate feelings of injustice.

Research by Bies and Shapiro (1987) and Baron (1985) has demonstrated the powerful role that explanations can play in dispute resolution. It is likely to be particularly important for third parties to impart their causal accounts to negotiators before the latter have had a chance to devise their own interpretation of events, which they will subsequently pass on to their constituents. This study suggests that, in the absence of any negative information regarding the procedure, third party, or execution of the procedure in a dispute, constituents primarily focus on the favorability of the outcome in determining their satisfaction and fairness, and negotiators focus on both how the procedure was enacted and the outcome received.

The explanations negotiators give constituents is also a topic worthy of investigation. As discussed in the agency theory literature (e.g., Eisenhardt, 1988), negotiators may prefer constituents to evaluate them on the basis of their behavior in negotiations, but constituents may prefer to evaluate negotiators on the basis of the outcomes they attained. Such differences in performance evaluation criteria and expectations may not only affect constituents' perceptions of procedural and distributive justice but also their perceptions of their negotiators, leading to a possible escalation of within-group conflict.

The outcome effects on distributive fairness judgments in this study suggest that in certain contexts, the objective favorability of an outcome and its perceived fairness may have a curvilinear relationship. When disputants believe that resource distribution should be based on an equality norm, it seems likely that they will see both outcomes that are extremely favorable

and those that are extremely unfavorable to one disputant as unfair. We know of no research that has been able to demonstrate such a relationship, but it seems plausible. The present results certainly show a ceiling effect for measures of outcome fairness. Perhaps a negotiation task in which disputants had a close relationship—as workers in the same office or as good friends, for instance— would produce results supporting this idea.

The laboratory context of this study and the use of student subjects suggest that caution be used when making generalizations to managers in organizational settings. Nevertheless, we based the three-issue dispute on an actual dispute that occurred in a securities company, and several growing trends, including networked computers, electronic mail, computer conferencing, and "worksteading" (employees working at home), offer natural settings for organizational conflict resolution that are not too different from the context created in this study. Certainly, more research on managerial third-party roles and the reactions of constituents and negotiators is warranted. Future research should continue to examine variation within, and not just between, dispute resolution procedures. The present study suggests that further research on how managers acting as third parties enact conflict resolution procedures is necessary, and such research will continue to enrich understanding of procedural and distributive justice.

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ORGANIZATIONAL SOCIALIZATION TACTICS: A LONGITUDINAL ANALYSIS OF LINKS TO NEWCOMERS' COMMITMENT AND ROLE ORIENTATION

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In this replication and extension of an earlier study, we found that newcomers' organizational socialization experiences were negatively related to role innovation after they had been on their jobs 6 and 12 months and positively related to organizational commitment after 6 months. Role innovation and commitment were negatively correlated at 6 months. Results suggest that organizations should be able to tailor newcomers' socialization experiences to foster a desired commitment–role orientation profile.

Several authors have noted the importance of the initial period of employment in an organization in shaping employees' subsequent attitudes and behaviors (e.g., Buchanan, 1974; Hall, 1976; Wanous, 1980). The socialization experiences that organizations provide to newcomers have received particular attention (Feldman, 1976; Van Maanen & Schein, 1979). Perhaps the best-known conceptual work in this area is that of Van Maanen and Schein, who described six dimensions along which socialization tactics vary. The labels given to these dimensions reflect the tactics defining the extremes of each; the six resulting polarities are collective versus individual, formal versus informal, fixed versus variable, sequential versus random, investiture vesus divertiture, and serial versus disjunctive.

Recently, Jones (1986) suggested that Van Maanen and Schein's six dimensions reflect a single, global polarity that he labeled the institutionalized-versus-individualized dimension. Institutionalized socialization is characterized by common initiatory and learning experiences (a *collective* socialization tactic). The socialization is *formal* in that it occurs outside a newcomer's work setting. Institutionalized socialization also offers explicit guidelines about the sequence and timing of progression in an organization: these tactics are labeled *sequential* and *fixed*, respectively. Role models for newcomers are present, constituting a *serial* socialization tactic, and social

support from organization members conf rms the newcomer's identity, constituting *investiture*. In contrast, individualized socialization is characterized by unique initiatory and learning experiences (it is *individual*) and on-the-job training (it is *informal*). Providing little information about the sequence or timing of career progression, the organization uses *random* and *variable* socialization tactics. Requiring newcomers to develop their own roles, it employs a *disjunctive* tactic. Finally, treatment by organization members that disconfirms newcomers' identities constitutes *divestiture*. Because the institutionalized-individualizec distinction may not fit each of the six dimensions equally well, we used it merely to refer conveniently to the socialization dimensions, not as a basis for analyses.

Jones facilitated empirical investigation of the effects of socialization on newcomers by developing questionnaire measures of the six socialization dimensions. He used the measures to examine the relations between these dimensions and various personal and role outcomes among new M.B.A.-degree-holders five months after they began work. In the present study, we replicated and extended Jones's research by longitudinally examining the relations between the socialization dimensions and two of those outcomes: role orientation and organizational commitment.

OUTCOMES RELATED TO ORGANIZATIONAL SOCIALIZATION

Role Orientation

Following Van Maanen and Schein (1979), Jones (1986) described role orientation as a continuum with conformity to established roles and procedures at one end and innovation in defining and enacting roles at the other. He called the two extremes a custodial orientation and role innovation and predicted that newcomers exposed to institutionalized socialization tactics would respond to their roles more custodially than newcomers experiencing individualized tactics. The logic behind this prediction follows.

Because newcomers who are socialized collectively and formally go through a common set of experiences and are segregated from day-to-day organizational activities during training, they are exposed to a more narrow range of situations and acceptable responses; thus, these institutionalized tactics inhibit innovation. Serial tactics may promote a custodial role orientation in a similar way: newcomers exposed to someone who has done, or is doing, their new job have clearer guidelines for the job and less need to learn on their own than newcomers who have no such exposure. Sequential and fixed tactics, whereby newcomers receive information about the sequence and timing of their progress in the organization, make newcomers less likely, as Jones noted, to "rock the boat" (1986: 265). Finally, Jones argued that divestiture encourages innovative role orientations because, unlike investiture, it causes newcomers to question assumptions about their behavior and challenges them to justify or modify it.

Jones (1986) noted two differences between his predictions about the relations between socialization tactics and role orientation and those made

by Van Maanen and Schein (1979). First, Van Maanen and Schein argued that because fixed tactics provide newcomers with information about the timing of upcoming organizational experiences, they serve to increase certainty and reduce anxiety about the future, which can lead to an innovative orientation. In contrast, Jones predicted that the certainty associated with fixed tactics would decrease innovation. Second, Van Maanen and Schein argued that investiture would strengthen newcomers' belief in their own competencies and thus make innovation more likely. Jones suggested that the positive support associated with investiture reduces the likelihood that newcomers will question any of their own assumptions and thus makes innovation less likely.

Jones's findings on role orientation were consistent with his predictions for each of the six dimensions of socialization, including the two on which his predictions conflicted with Van Maanen and Schein's original hypotheses. In each case, the institutionalized tactic was associated with a custodial role orientation and the individualized tactic with an innovative orientation. The strongest relations were reported for the serial-disjunctive, sequential-random, and fixed-variable dimensions.

Organizational Commitment

Organizational commitment is commonly conceptualized as an affective attachment to an organization characterized by shared values, a desire to remain in the organization, and a willingness to exert effort on its behalf (Mowday, Steers, & Porter, 1979). Jones hypothesized that newcomers experiencing institutionalized tactics would be more committed than those given individualized treatment because the former involve more structured and information-laden experiences and, as such, present newcomers with few "problems in searching for situational consistency" (1986: 266). Newcomers' anxiety, confusion, and concern about their roles are thus low. Coming at a time when much is new and different, these low levels will be appreciated and may strengthen newcomers' commitment to an organization.

Jones found significant correlations between commitment and all but two of the six socialization dimensions (collective-individual and formal-informal); commitment's strongest relations were with the investiture-divestiture and serial-disjunctive dimensions. Although Jones initially predicted that collective and formal tactics would increase commitment slightly by reducing anxiety, he noted in retrospect that they may also increase the psychological distance between newcomers and other members of an organization, thereby reducing commitment.

Organizational Commitment and Role Orientation

Although the link between commitment and role orientation was not a major focus of his study, Jones's (1986) data have some interesting implications relevant to that issue. Randall discussed this link, arguing that a potential negative consequence for an organization of highly committed employees is a "lack of organizational flexibility, innovation, and adaptability"

and an "inviolate trust in past policies and procedures" (1987: 462). She speculated further that an inverted U-shaped curve "with an apex at a moderate level of commitment" (1987: 467) may best describe the relations between commitment and various consequences. In Jones's study, commitment and role orientation were negatively correlated ($r = -.28, p < .01$) and the socialization measures correlated in opposite directions with commitment and role orientation. An organization trying to design a socialization strategy that maximizes both commitment and innovation may find these results somewhat disconcerting. Newcomers who develop a strong commitment to the organization may not be sufficiently innovative and those who are innovative may not be sufficiently committed. Jones's findings, of course, must be interpreted with caution. First, his data do not allow us to evaluate the causal connection between commitment and role orientation. Second, the relation he reports is modest and certainly does not rule out the possibility of having both highly committed and role-innovative employees. Indeed, it may be that the extent to which an organization communicates and rewards a particular role orientation moderates any link between these two variables. Finally, Jones did not test for the possibility that the relation between organizational commitment and role orientation is nonlinear.

Purposes of the Present Study

One purpose of this study was to replicate Jones's (1986) findings, a particularly desirable goal since only some of his results fit Van Maanen and Schein's (1979) theoretical predictions. A second purpose was to extend his work by examining the relations between tactics and outcomes longitudinally. Thus, in addition to measuring socialization tactics, role orientation, and organizational commitment midway through a first year of employment, as Jones did, we obtained outcome measures at the end of the year. Finally, we examined the link between role orientation and organizational commitment. By considering the concurrent and time-lagged relations between these variables as well as the relations between them and the socialization dimensions, we can speculate about how organizations might structure early socialization in order to foster the particular commitment–role orientation profile they desire.

METHODS

Respondents and Data Collection

Data were collected from two successive graduating classes of undergraduate and graduate (M.B.A.) business programs. At the end of the academic year, we asked class members whether they had accepted full-time jobs and if they had, when employment was to begin. This information enabled us to send the first questionnaire 6 months after each graduate began work. Of the 207 questionnaires sent, 170 (82%) were returned. Because we were interested in the socialization of newcomers, we report only the data from the 132 individuals (101 men and 31 women) who were not working for

ε family business and who had not worked previously for their post-graduation employer. Of the 132 individuals, 105 (80 men and 25 women) also completed the questionnaires they received after 12 months on the job.

Measures

Socialization tactics. The six 5-item scales developed by Jones (1986) to measure socialization tactics were included on the 6-month questionnaire. Jones (1986) reported reliability estimates (Cronbach's alphas) ranging from .68 to .84 for these scales. Table 1 lists parallel reliabilities in our data. High scores on these measures indicate exposure to institutionalized socialization practices.

Outcome measures. A slightly modified version of Jones's role orientation measure appeared on both the 6- and 12-month questionnaires. The original 5-item version (α = .89) included the item "While I am satisfied with my overall job responsibilities, I have altered the procedures for doing my job." Because of ambiguity in this item—disagreement may reflect dissatisfaction with responsibilities, or a custodial orientation, or both—we omitted it in our study. High scores on this scale reflect an innovative role orientation.

The 6- and 12-month questionnaires also included the 8-item Affective Commitment Scale (ACS) (Allen & Meyer, 1990; Meyer & Allen, 1984). The ACS correlates strongly with the widely used 15-item Organizational Commitment Questionnaire (Mowday et al., 1979), and reliability estimates reported for several samples have ranged from .74 to .88 (Allen & Meyer, 1990; McGee & Ford, 1987; Meyer & Allen, 1984; Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989). Table 1 shows the reliabilities of the outcome measures collected in the present study.

RESULTS

In analyses that involved only measures obtained at 6 months, we used data from all the respondents (N = 132); in analyses involving measures taken at 12 months, we used data from the subgroup completing both questionnaires (N = 105). Table 1 reports descriptive statistics and correlations among all measures.

Socialization Tactics and Role Orientation

A significant negative correlation was obtained between each measure of socialization tactics and role orientation at 6 and 12 months, indicating that institutionalized tactics in general are associated with a custodial orientation and individualized tactics with an innovative orientation. Perhaps more informative are the results of multiple regression analyses in which we entered all six socialization tactic measures simultaneously as predictors of role orientation at 6 and 12 months. As the adjusted R^2's of .25 and .21 for the two measurement points show (Table 2), these predictors explain a

TABLE 1
Descriptive Statistics and Zero-order Correlations[a]

Variables	N	Means	s.d.	1	2	3	4	5	6	7	8	9	10
1. Collective	130	4.07	1.52	(.70)									
2. Formal	129	3.49	1.22	.66***	(.62)								
3. Fixed	128	4.01	1.45	.43***	.51***	(.77)							
4. Sequential	129	4.23	1.51	.57***	.66***	.78***	(.76)						
5. Investiture	132	5.04	1.22	.20*	.23**	.45***	.36***	(.73)					
6. Serial	131	4.80	1.39	.46***	.48***	.67***	.66***	.41***	(.76)				
7. Organizational commitment, 6 months	129	4.03	1.17	.21*	.22**	.40***	.31***	.49***	.30***	(.83)			
8. Role orientation, 6 months	131	3.53	1.40	-.30***	-.25**	-.40***	-.40***	-.33***	-.50***	-.23**	(.82)		
9. Organizational commitment, 12 months	103	3.80	1.18	.02	-.04	.11	.03	.39***	.11	.68***	-.16	(.85)	
10. Role orientation, 12 months	104	3.71	1.32	-.33***	-.25**	-.39***	-.29**	-.31***	-.46***	-.09	.65***	-.11	(.77)

[a] Reliability coefficients (α) are shown in parentheses on the diagonal. The response format for all measures ranged from 1 to 7. Labels for the socialization tactics reflect the direction of scoring; all were measured at 6 months. For role orientation, lower values reflect custodial role orientations and high values, innovative orientations.

  * $p < .05$
  ** $p < .01$
  *** $p < .001$

<center>TABLE 2</center>
<center>Results of Multiple Regression Analyses[a]</center>

Socialization Tactics	6 Months		12 Months	
	Role Orientation	Organizational Commitment	Role Orientation	Organizational Commitment
Collective	−.10	.05	−.19	−.04
Formal	.09	.00	.01	−.07
Fixed	.04	.28*	−.07	.04
Sequential	−.17	−.07	.09	−.09
Investiture	−.12	.40***	−.10	.44***
Serial	−.36**	−.04	−.34*	.01
Adjusted R^2	.25	.25	.21	.13
F	7.99***	7.95***	5.30***	3.54**
df	6,119	6,117	6,93	6,92
N	126	124	100	99

[a] Entries are standardized regression coefficients. Labels for the tactics reflect the direction of scoring; all were measured at 6 months. For role orientation, low scores reflect a custodial role orientation and high scores, an innovative role orientation.

     * $p < .05$
    ** $p < .01$
  *** $p < .001$

significant amount of the variance. Only the serial-disjunctive dimension, however, contributes significantly to prediction when other dimensions are controlled.

Socialization Tactics and Organizational Commitment

Each socialization tactic measure correlated significantly with organizational commitment at 6 months. Institutionalized tactics tend to be associated with higher levels of commitment. The investiture-divestiture dimension, which correlated most strongly with commitment at 6 months, is the only socialization measure that correlated significantly with it at 12 months. Results of the multiple regression analyses reported in Table 2 reveal that the socialization measures together account for a greater proportion of the variance at 6 months (adjusted $R^2 = .25$) than at 12 months (adjusted $R^2 = .13$). Although both the fixed-variable and investiture-divestiture dimensions contribute uniquely to prediction at 6 months, only the latter does so at 12 months.

Organizational Commitment and Role Orientation

There is a significant, albeit modest, negative correlation between commitment and role orientation at 6 months ($r = −.23$). The concurrent correlation between the variables at 12 months, although negative, is negligible ($r = −.11$), as are the time-lagged correlations ($r = −.09$ and $−.16$).

To test Randall's (1987) suggestion that the relationship between commitment and role orientation is curvilinear, we split the data on the 6-month

commitment measure into thirds. For employees with low, moderate, and high levels of commitment, the means for role orientation were 3.85, 3.54, and 3.65 at 6 months and 3.82, 3.63, and 3.65 at 12 months. This pattern of means provides no evidence that moderate commitment is associated with greater role innovation than either weak or strong commitment.

DISCUSSION

Our findings with respect to socialization tactics and role orientation replicate those reported by Jones (1986) and provide support for four of Van Maanen and Schein's (1979) original hypotheses. The correlations involving the fixed-variable and investiture-divestiture dimensions were consistent with Jones's predictions but not with Van Maanen and Schein's.

The best predictor of role orientation, and the only one to contribute uniquely in the multiple regression analyses, was the serial-disjunctive dimension. Since the remaining dimensions all correlated with role orientation but did not emerge as significant predictors in the multiple regression analyses, it appears that much of the variance they share with role orientation they also share with each other. Possibly, some common factor, such as the degree of certainty in a workplace, underlies the measures and is responsible for their links with role orientation. An important direction for future research, therefore, is to identify the processes by which socialization tactics influence role orientation.

Like Jones, we found that organizational use of individualized tactics correlated negatively with employees' commitment at 6 months. Although only two dimensions—the fixed-variable and investiture-divestiture polarities—emerged as significant predictors in the multiple regression analysis, this finding probably also reflects the variance the tactics share. The long-term relations, however, between the socialization measures and commitment were quite weak. With the exception of investiture-divestiture, none had zero-order correlations with commitment at 12 months. Relations may exist at 6 months because institutionalized tactics, by providing a strong structure for newcomers, alleviate some of the anxiety associated with entering a new organization. This anxiety reduction may in turn contribute to the development of commitment. Although our data do not address this process issue, previous research evidence of a negative correlation between role ambiguity and commitment (e.g., Morris & Sherman, 1981) is certainly consistent with this suggestion.

The lack of significant relations between the socialization measures and commitment measured at 12 months suggests that whatever was responsible for the correlation at 6 months was no longer operating at the second measurement point. One possible explanation is that the socialization practices organizations use change during the course of the first year of an individual's employment. If that were true, however, we would expect to see a similar reduction in the correlations involving role orientation. A more likely ex-

planation, therefore, is that other factors not assessed in this study are responsible for shaping commitment.

Although Jones's (1986) original findings might indicate that organizations wishing to develop both strong commitment and a propensity to innovate in new employees will have difficulty accomplishing both goals, our data suggest otherwise. First, as mentioned above, with the exception of investiture, the socialization tactics used in the first 6 months of employment are not related to commitment after a full year in an organization. Second, the value of the negative correlation between commitment and role orientation obtained at 6 months was negligible at 12 months. It may be possible, therefore, for organizations to tailor their socialization practices to foster the particular commitment−role orientation profile most suited to their needs.

Organizations that want employees who are both committed and willing to innovate might be best advised to use investiture to foster commitment but at the same time to minimize the influence of current or previous job incumbents and encourage newcomers to develop their own strategies for dealing with their new roles, a disjunctive tactic. Such organizations should not be tempted to use institutionalized tactics other than investiture to foster early commitment. Although these tactics may have beneficial effects on short-term commitment, they do not appear to enhance long-term commitment. More important, they may well have detrimental effects on role innovation.

Organizations wishing to minimize the commitment of employees, as in cases in which a high rate of turnover is desirable, should be able to do so by using divestiture. They might then encourage an innovative role orientation by using individualized tactics, especially disjunctive ones, or they might encourage a custodial role orientation by using institutionalized tactics, particularly serial ones. Employers considering such an approach, however, should be aware of the evidence of a link between affective commitment and various aspects of job performance (DeCotiis & Summers, 1987; Meyer et al., 1989; Steers, 1977). High turnover might be achieved at the cost of low performance unless an organization makes special efforts to encourage productivity, such as offering monetary incentives.

In many organizations, socializing newcomers is the responsibility of the person whose position the newcomer will occupy. Our findings may have implications for how organizations manage these incumbent-newcomer relationships. The association between the disjunctive tactic and role innovation found here parallels Van Maanen and Schein's suggestion that organizations wishing to stimulate innovation should "minimize the possibility of allowing incumbents to form relationships with their likely successors, for these role incumbents will typically teach the recruit the 'old' ways of doing things" (1979: 250). We suggest, however, that organizations take care to ensure that newcomers do not feel isolated by this lack of contact. Indeed, in many organizations role incumbents may be the most

appropriate sources of the investiture experiences that are needed to foster newcomers' commitment. In addition, research on mentoring has suggested there are other positive outcomes for newcomers who have contact with experienced employees (Kram, 1985). Thus, it might be more judicious for organizations desiring innovation to make previous role incumbents available to newcomers and at the same time to use mechanisms like job descriptions and performance appraisal to let newcomers know that they have considerable job discretion (Nicholson & West, 1988; West, 1987) and need not interpret a role exactly as their predecessors did.

The present findings are important because they add to a very small body of empirical information about socialization tactics. Our findings, like those of Jones (1986), are limited in that they rely on self-report measures. Nonetheless, they provide the groundwork for future studies using alternate modes of measurement. Of particular interest would be attempts to examine links between actual observed tactics, as opposed to employee ratings, and behaviors. Another limitation of studies to date involves sampling: the respondents in both our study and in Jones's study were business school graduates. Possibly the links observed in these studies are unique to this population. Previous research has found that confirmed expectations have a significant long-term effect on commitment (Meyer & Allen, 1988). Thus, it is not clear whether the link between investiture and commitment, for example, is due to something inherent in investiture or simply to the fact that investiture bears out the expectations of business school graduates. In future research, it would be useful to determine whether employees expecting divestiture (e.g., military recruits) become more committed when their expectations are confirmed or when, contrary to expectation, they experience investiture.

Finally, it should be noted that although we used Jones's institutionalized-versus-individualized terminology as a convenient way to refer to the six dimensions together, the empirical legitimacy of this unidimensional view has not yet been established. In fact, Jones reported a four-factor solution in a factor analysis of the 30 items, and we also found an unreported multifactor solution in a factor analysis of our data. Moreover, the substantive reason for identifying each tactic as either institutionalized or individualized is not clear. A case could be made, for example, for a reversal in Jones's classification of investiture and divestiture. Investiture, with its focus on social support and identity confirmation, might be considered an individualized strategy, and divestiture, with its emphasis on disconfirming identity, an institutionalized strategy. If use of Jones's classification is to continue, it will be necessary to provide evidence of its validity that goes beyond similarities in the patterns of correlations with outcomes.

In summary, our findings replicate and extend those reported by Jones (1986). The results of the time-lagged analyses provide evidence beyond that of the concurrent correlations consistent with the hypothesis that early socialization experiences have a causal influence on role orientation. Further, they suggest that, with the exception of the investiture-divestiture dimen-

sion, such experiences may have little long-term effect on commitment. Finally, the results suggest that organizations need not be concerned that they can foster an innovative role orientation only at the risk of reducing commitment, as Jones's findings and recent theoretical work (Randall, 1987) might seem to imply. Although tactics that are positively linked to role innovation are negatively related to organizational commitment in the short term, the long-term relations are, for the most part, negligible. Moreover, the tactics with the strongest impacts on role orientation and organizational commitment appear to be quite different, suggesting that organizations can tailor their socialization practices to foster in their employees a desired organizational commitment—role orientation profile.

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CHRONIC WORK STRESS AND COPING:
A LONGITUDINAL STUDY AND SUGGESTED
NEW DIRECTIONS

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This study examined the relationship between chronic work stressors, coping techniques, distress symptoms, and work performance for 91 organizational newcomers. Contrary to expectations, choice of coping technique failed to account for significant variance in distress symptoms, mastery, or performance. However, distress symptoms reported prior to beginning a new job accounted for 32 percent of the variance in distress symptoms reported nine months after beginning the job, suggesting a possible dispositional influence on symptom reporting. Explanations for the findings are discussed and several suggestions offered for improving the future study of work stress.

In the past decade, researchers have focused considerable attention on the ways in which individuals cope with stressful life events (Aldwin & Revenson, 1987; Folkman, Lazarus, Gruen, & DeLongis, 1986). One of the major conclusions arising from that research is that the coping process cannot be investigated apart from the context in which the coping behavior occurs (Billings & Moos, 1981, 1984; Folkman et al., 1986). Although some of the most commonly encountered chronic stressors arise from work, little is known about the relationships between chronic work demands, coping techniques, distress symptoms, and work performance. The purpose of this study was to examine those relationships.

The present study extends the coping literature in three ways. First, it examined coping responses to chronic work stressors, which is important since chronic stressors are better predictors of dysfunctional health outcomes than episodic (life-event) stressors (Kanner, Coyne, Schaefer, & Lazarus, 1981).

Second, it examined a broad range of outcomes, including symptoms of distress, self-reported mastery of a job, and supervisors' assessments of work performance. Although mastery and performance outcomes are commonly

examined in other organizational research areas, they have received surprisingly little attention in research on coping.

Third, the study incorporated a longitudinal design that examined work demands, coping responses, and outcomes over a nine-month period. With rare exceptions (e.g., Aldwin & Revenson, 1987; Felton & Revenson, 1984), previous studies have used cross-sectional designs.

The longitudinal design not only permitted examination of the lagged effects of coping responses on distress symptoms and performance outcomes, but also examination of the relationship between distress symptoms reported on a new job and those that an individual may have brought to the job.

Researchers have often approached work stress from a "situationalist" perspective: they have measured job stressors and related them to stress outcomes. However, the cross-sectional designs typical of those studies do not allow discrimination between stress outcomes related to a job and those unrelated to it. Thus, the studies rest on an assumption that all stress outcomes are related to the work situation studied. The critical issue in work stress research is isolating symptoms that reflect dispositional influences or personal life stress from those attributable to an individual's work situation.

This study, then, had two purposes: (1) to examine the effects of coping strategies on distress symptoms, the mastery of job skills, and performance, and (2) to examine the relationship between distress symptoms experienced on a new job and those brought into the job. We collected data in three "waves": time 1, prior to an individual's first day of work on a new job, time 2, six months after the beginning of the new job, and time 3, nine months after that beginning. These time points coincide roughly with three stages of socialization: anticipatory socialization, encounter, and change and acquisition (Nelson, 1987: 313–315).

The primary focus of the study was to examine the differing effects of problem-focused, appraisal-focused, and emotion-focused coping on distress symptoms, mastery of job skills, and performance. Previous research has found problem-focused coping, or managing the source of stress, to be negatively related to depression and physical symptoms and positively related to self-confidence (Billings & Moos, 1984). In addition, problem-focused coping has been reported to be the most effective coping strategy in a study of working women (O'Neill & Zeichner, 1985). Therefore,

> Hypothesis 1: Problem-focused coping reported after six months on a job will be negatively related to distress symptoms and positively related to mastery and performance reported after nine months on the job.

Appraisal-focused coping, the evaluation of the potential for threat or challenge from a situation, has been found to explain significant variance in psychological distress symptoms (Folkman et al., 1986). Similarly, Latack (1986) found that cognitive reappraisal of stressful work events was negatively associated with reported levels of job-related anxiety, job dissatisfaction, and intention to leave an organization. We therefore predicted that

*Hypothesis 2: Appraisal-focused coping reported after six
months on a job will be negatively related to distress
symptoms and positively related to mastery and perfor-
mance reported after nine months on the job.*

In contrast to the findings on problem- and appraisal-focused methods of
coping, previous research has found emotion-focused coping used to deal
with a stressful event to be related to negative outcomes. Emotion-focused
coping, which involves cognitive or behavioral efforts to manage response to
stressors, has been associated with depression and dysfunctional physical
symptoms (Billings & Moos, 1984) and with high levels of somatic com-
plaints (Latack, 1986) and anxiety (Stumpf, Brief, & Hartman, 1987). There-
fore,

*Hypothesis 3: Emotion-focused coping reported after six
months on a job will be positively related to distress
symptoms and negatively related to mastery and perfor-
mance reported after nine months on the job.*

The final hypothesis addresses the relationship between symptoms that
newcomers bring into a job and symptoms that may be work-related:

*Hypothesis 4: Distress symptoms reported prior to enter-
ing a work organization will explain a significant propor-
tion of the variance in distress symptoms reported after
nine months on the new job.*

METHODS

Respondents

The respondents were 97 newcomers to three organizations: a large
university (28 respondents); an oil-field servicing company (31); and an
electronics manufacturer (38). During the nine-month study, six respondents
left their organizations, resulting in a final group of 91 newcomers with 51
men and 40 women. The respondents' average age was 42, all possessed
undergraduate degrees, and 62 percent had graduate degrees. They held
professional positions as engineers, faculty members, and support-staff
members.

Independent Variables

Work demands. Daily work demands (chronic stressors) were measured
by 32 items from the Stress Diagnostic Survey (Ivancevich & Matteson,
1980). We asked respondents to indicate the extent to which they experi-
enced stressors such as work overload, role ambiguity, and organizational
politics on a scale ranging from 1 (never) to 7 (always) (α = 93). Work
demands were measured at time 2, six months after respondents began new
jobs. This measurement point represents the encounter stage of socialization
in which the demands of a job become evident to a newcomer.

Focus of coping. The scales measuring coping focus were taken from the
Health and Daily Living Form (Moos, Cronkite, Billings, & Finney, 1982).

Problem-focused coping was measured by asking respondents the frequency with which they took 12 actions, such as 'Made a plan of action and followed it" and "Took things one step at a time." The emotion-focused coping scale also consisted of 12 items, including "Let out my feelings somehow" and "Exercised more to reduce tension." Appraisal-focused coping was measured by 4 items, 2 of which were "Considered several alternatives for handling the problem" and "Went over the situation in my mind to try and understand it." Responses for the coping scales could range from 1 (never) to 4 (usually); internal consistency reliabilities in the present study were .76 for problem-focused coping, .72 for appraisal-focused coping, and .75 for emotion-focused coping. We took coping measures at time 2, six months into the respondents' new jobs. During this stage of socialization, newcomers attempt to manage the demands that have become evident to them, so it was likely that substantial coping activity would be observed at this point.

Dependent Variables

Distress symptoms. We used 32 items from the Symptoms Checklist-90-R (Derogatis, 1977) to tap symptoms of d stress. Respondents were asked to indicate the extent to which they experienced a given symptom, with responses ranging from 1 (did not notice it) to 5 (very intense). Representative somatic symptoms included restlessness, irritability, stomach upsets, and muscle tension ($\alpha = .84$). We measured distress symptoms both at time 1, prior to the first day at work, and at time 3, nine months later.

Self-reported mastery. Self-reported mastery was measured by a 21-item scale constructed specifically for the present study. Self-reported mastery consisted of items such as "I perform my everyday tasks well," "I have found out what others expect of me at work," and "I work well with others in my work group." A complete listing of the mastery items is presented in the Appendix. Respondents were asked to indicate their agreement or disagreement with each item on a seven-point scale.

The mastery scale was pretested on 60 students playing the parts of employees of a company ($\alpha = .79$). Each assessed mastery of a particular job. In addition, we performed a principal components analysis with a varimax rotation using the pretest data. Results indicated that the scale formed a single factor with an eigenvalue of 3.17.

The mastery variable was measured at time 3, nine months into the jobs. Previous research has indicated that change and acquisition, the third stage of socialization, occurs roughly at the nine-month point, when a newcomer should begin to demonstrate mastery of a job. Internal consistency reliability for the mastery scale with the study data was .71.

Supervisor-rated performance. Supervisors were asked to rate their new employees' performance on a single item using a seven-point scale ranging from "performance not at all satisfactory" to "performs extremely well." Performance was rated at time 3.

RESULTS

Before conducting further analyses, we examined the variables employed in the study for effects of organization, age, gender, and work experience; none of those characteristics were correlated with any of the study variables.

Table 1 presents the intercorrelation matrix, means, and standard deviations for all study variables. An inspection of the mean values reveals that newcomers reported a moderate level of work demands and distress symptoms and fairly high levels of mastery. Appraisal-focused coping was the most widely used coping strategy. Problem-focused, emotion-focused, and appraisal-focused coping had a mean intercorrelation of .33. The intercorrelations are similar to those other studies have reported (Aldwin & Revenson, 1987; Billings & Moos, 1981).

To assess the relationships between work demands, coping strategies, and the three outcome variables, we performed a series of hierarchical regression analyses, constructing separate equations for each dependent variable. Table 2 presents a summary of the regression analysis results. Using self-rated mastery as the dependent variable, we first entered work demands, then the set of coping techniques. Work demands accounted for 10 percent of the variance in mastery. Adding the coping strategies increased the variance explained to 15 percent, not a significant increase. The overall equation was significant ($F = 3.04$, $p < .01$). In the second equation, we regressed supervisor-rated performance on work demands and the three coping strategies. No significant associations emerged; the variables combined explained only 3 percent of the variance in performance. The overall equation was thus not significant ($F = .68$, $p > .10$).

The design of the study permitted us to assess whether symptoms of distress that respondents had reported prior to entering their new work situations explained variance in distress symptoms at time 3 over and above the variance accounted for by work demands and coping strategies. The total variance explained by this equation was 41 percent. Prior distress symptoms, an individual difference variable, accounted for 32 percent of the variance, and work demands, a situational variable, contributed 8 percent; coping techniques did not significantly contribute to the variance explained. The final equation was significant ($F = 6.39$, $p < .001$).

A concern when changes in self-reported variables are measured is gamma change—respondents' restructuring their cognitive maps or mentally redefining the variables being measured (Golembiewski, Billingsley, & Yeager, 1976; Tennis, 1989). Undetected, such redefinitions confound the interpretation of any measured changes in a variable. To determine if gamma change had occurred, we examined the distress symptoms measured at times 1 and 3 for similarity in factor structures by computing a coefficient of congruence and assessing its significance. The coefficient of congruence (ϕ) was .88 and was significant at the .05 level according to a comparison pro-

TABLE 1
Means, Standard Deviations, and Correlation Matrix[a]

Variables[b]	Means	s.d.	Correlations						
			1	2	3	4	5	6	7
1. Demands	3.50	1.04							
2. Problem-focused coping	2.91	0.36	-.20*						
3. Appraisal-focused coping	3.45	0.42	-.06	.48**					
4. Emotion-focused coping	2.19	0.36	.24**	.35**	.20*				
5. Distress symptoms, time 1	3.04	0.49	.19*	-.01	-.02	.21*			
6. Distress symptoms, time 3	3.11	0.10	.20**	.01	-.04	.16**	.56**		
7. Job mastery	5.46	0.54	-.31**	.29**	.11	.05	-.06	-.23**	
8. Performance	5.52	1.02	-.11	-.02	-.13	-.08	-.05	-.17*	.10

[a] N = 91.
[b] Variables 1 through 4 were measured at time 2; variables 6, 7, and 8 were measured at time 3.
* p < .05
** p < .01

TABLE 2
Regression Analysis Results

| Predictor Variables[a] | Outcome Variables[b] | | | | | |
| | Mastery | | Performance | | Distress Symptoms | |
	ΔR^2	R^2	ΔR^2	R^2	ΔR^2	R^2
Demands	.10	.10**	.01	.01	.08	.08**
Appraisal-focused coping	.00	.10	.02	.03	.00	.08
Emotion-focused coping	.01	.11	.00	.03	.01	.09
Problem-focused coping	.04	.15	.00	.03	.00	.09
Distress symptoms`					.32	.41**
Overall adjusted R^2		.14		.03		.40
F		3.04**		.68		6.39**

[a] All predictor variables were measured at time 2, except for distress symptoms, which was measured at time 1.

[b] Outcome variables were measured at time 3.

* $p < .05$

** $p < .01$

cedure from Bedeian, Armenakis, and Randolph (1988). Thus, it appears that gamma change did not occur between the two symptom measures.

In summary, findings did not support Hypotheses 1, 2, and 3, which predicted positive effects for problem-focused and appraisal-focused coping and negative effects for emotion-focused coping. Findings did support Hypothesis 4, which predicted that distress symptoms brought to jobs by newcomers would account for a significant portion of the variance in distress symptoms reported by employees nine months into their jobs.

DISCUSSION

The results of this study point to two very important issues for research on work stress. The first issue is the need to reexamine traditional measures of coping to determine their appropriateness for use in work settings. This study found that no significant benefits distinguished any of the three coping strategies examined. Current instruments designed to measure strategies for coping with stressful life events simply may not be appropriate for studying coping in work settings.[1]

Second, it was found that distress symptoms reported prior to beginning a job accounted for the lion's share of the variance in distress symptoms nine months later. This suggests that individuals bring into a job a large proportion of the symptoms they experience on the job. Virtually all previous work stress research has assumed that stress symptoms experienced on a job are related to work stress. The findings of our study suggest that researchers need to be cautious in this assumption. Symptoms thought to originate in a workplace may actually originate elsewhere.

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[1] For a notable exception, see Latack (1986).

Although we did not set out to test the issue, these findings can be considered in light of the debate between "dispositionalists" and "situationalists." In their research, dispositionalists have argued that work attitudes and behaviors are directly linked to individual attributes (Staw, Bell, & Clausen, 1986; Staw & Ross, 1985). In contrast, situationalists have contended that situational characteristics affect job attitudes more than individual differences do (Davis-Blake & Pfeffer, 1989; Gerhart, 1987). Somewhere in the middle are "interactionists," who argue that individual differences and situational characteristics continuously interact and that research must focus simultaneously on individuals, situations, and their interactions (Schneider, 1983).

The dispositional-situational battle has been fought primarily over potential dispositional effects on job attitudes. However, researchers have paid relatively little attention to potential dispositional effects on work stress. Although our research did not provide an unambiguous test, results did suggest the possibility of a dispositional influence on reported distress symptoms. The next step is to identify dispositions, measure them in one time period, and use them to predict symptoms in another time period. Potential characteristics that may affect symptom reporting include negative affectivity—the tendency to accentuate negative aspects of the world in general (Brief, Burke, George, Robinson, & Webster, 1988; Watson & Clark, 1984)—and dispositional optimism (Scheier & Carver, 1987). We do not advocate a purely dispositional approach to the study of work stress but suggest that the most appropriate approach is the interactionist one, in which researchers examine dispositional factors like negative affectivity, situational factors such as work demands and personal life stress, and their interactions.

This study also has a practical implication. The results suggest that employers should be cautious about aggressively pursuing stress reduction strategies. If personal characteristics predispose an individual to distress symptoms, such environmental interventions as job redesign may have limited value in symptom reduction. Perhaps symptom-specific interventions would be more appropriate.

The limitations of this study should be mentioned. The measure of work performance used had a single item, and the remaining measures were self-reports; these facts indicate that some caution in interpreting the results is warranted. In addition, data on the newcomers' previous job demands were not available, which made it impossible to estimate the magnitude of situational changes that occurred during their job transitions. We did assume, however, that demands change during socialization. The research of Katz (1985) and others has indicated that changing jobs is stressful, not only because job demands change but also because organizational demands change. Future studies should include reports of demands in people's previous jobs and contrast those with demands in their new jobs to permit a more rigorous examination of situational and dispositional factors.

Much remains to be learned about work stress. This study clearly sug-

gests two paths future research might take to advance knowledge in this area. Current coping measures should be reevaluated for use in work settings, for without appropriate measures, the nature of coping with work stress cannot be adequately investigated. In addition, future research should employ longitudinal designs to isolate work stress symptoms from symptoms influenced by dispositions or personal life stressors.

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APPENDIX

Items Comprising the Mastery Scale[a]

I am on good terms with others in this organization.
I have found out what other people expect of me at work.
I perform my everyday tasks well.
My workload in this job is something I can handle well.
I'm overwhelmed by conflicting demands made by others on my job. (R)
My boss and I have a good working relationship.
I work well with others in my work group.
I manage my work life and home life trade-offs well.
Whether or not I'm rewarded for performing my job well depends on my effort.
I do my job as I see fit.
When one person expects something of me that conflicts with what another person expects of me, I take action to resolve the conflict.
I have found ways of managing conflicts which arise between my work and my home life.
It's hard to get along with the people I work with. (R)
I'm uncomfortable with the politics in this organization. (R)
I have found out just how much authority I have in my job.
I'm developing myself for future career opportunities.
I'm not pleased with my job performance. (R)
I know where I fit in this organization's chain of command.
I make an effort to get along with my co-workers, and it pays off.
My job performance is important to this organization.
I'm comfortable in my relationships with others in the workplace.

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[a] R indicates reverse scored.

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INTERACTIVE EFFECTS OF "TYPE A" BEHAVIOR AND PERCEIVED CONTROL ON WORKER PERFORMANCE, JOB SATISFACTION, AND SOMATIC COMPLAINTS

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This research examined the moderating role of perceived control on the relations between Type A behavior and worker performance, job satisfaction, and somatic complaints. Results suggest that people with high levels of Type A behavior who also have high perceived control perform better and have greater job satisfaction than those low in perceived control. However, the former also reported more somatic complaints than the latter. Implications of our findings and directions for future research are discussed.

Perceived control—the belief that an individual has at his or her disposal a response that can influence the aversiveness of an event (Thompson, 1981)—is thought to affect people's beliefs about the causes of important outcomes in their lives, the amount of influence they have over events, and the resources they can access to reach their goals (Baltes & Baltes, 1986; Lefcourt, 1976). According to Skinner, Chapman, and Baltes, "Perceived control has been examined not only because it is interesting in itself, but also because it predicts important aspects of motivational, cognitive, and emotional functioning" (1988: 117; cf. Abramson, Seligman, & Teasdale, 1978; Bandura, 1977, 1982; Peterson & Seligman, 1984; Weiner, 1979, 1985). Perceived control is thought to be correlated with, though separable from, both the objective amount of control a person has in a situation and individual differences in locus of control.[1] Recently, Spector (1986) conducted a meta-

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[1] Locus of control is the generalized expectancy that rewards or outcomes in life are controlled either by an individual's actions (internality) or by other forces (externality) (Spector, 1988). Individuals with an internal locus of control tend to be more satisfied with their jobs than those with an external locus of control, rate their supervisors higher on consideration and initiating structure, report less role stress, perceive more autonomy and control, and enjoy longer job tenure (Spector, 1982).

analytic evaluation of over 100 studies and concluded that a high level of perceived control, measured as the degree of autonomy or participation in decision making an individual enjoys was associated with high levels of job satisfaction, organizational commitment, motivation, and performance and low levels of physical and psychological symptoms of stress.

In this article, we propose that perceived control plays an especially important role in the functioning of a particular type of individual, those exhibiting high levels of Type A behavior. The Type A behavior pattern is an epidemiological construct originating from Friedman and Rosenman's (1959, 1974) clinial observations of patients with coronary heart disease. Those authors described the pattern as "a complex of emotional reactions" (1974: 69) characterized by excessive achievement striving, competitiveness, time-urgency, and aggressiveness. Researchers have assumed that a need for control motivates people with high levels of Type A behavior (Glass, 1977). This need is thought to underlie their concern for competition and their fear of missing deadlines or wasting time. Glass (1977) also argued that these individuals' constant struggle to maintain control over their environment results in heightened physiological activity and eventual high risk for coronary heart disease. Research on Type A behavior has suggested that it is a risk factor in coronary heart disease (Cooper, Detre, & Weiss, 1981; Dembroski, Weiss, Shields, Haynes, & Feinleib, 1978; Matteson & Ivancevich, 1980). Further research has suggested that the anger-hostility dimension of the Type A construct, typically measured by Cook and Medley's (1954) hostility scale, is the aspect of the pattern most predictive of coronary heart disease (Barefoot, Dallstrom, & Williams, 1983; Booth-Kewley & Friedman, 1987; Williams, Barefoot, & Shekelle, 1985) and that the global Type A behavior pattern generally demonstrates a positive association with academic performance (Glass, 1977; Matthews, Helmreich, Beane, & Lucker, 1980; Ivancevich & Matteson, 1988; Taylor, Locke, Lee, & Gist, 1984).

The purpose of the present study was to examine the moderating role of perceived control on the relations of Type A behavior to job performance, job satisfaction, and somatic complaints. Although previous research (Davidson & Cooper, 1980; Glass, 1977) has demonstrated that people exhibiting Type A behavior respond to the need for control by striving to attain and maintain it, no one has examined the interactive impact of perceived control and Type A behavior on important outcomes of the control-striving process, including job performance and job satisfaction. If such individuals constantly strive to achieve more and more in order to feel in control, the extent to which they perceive that they are actually in control ought to have important implications.

Two arguments underlie this contention. First, when perceived control is low, people with high levels of Type A behavior may be distracted from concentrating on their performance tasks per se as they divert effort toward strategies to regain control. In contrast, those low on Type A behavior may not attend to the controllability of events as much as those high on Type A behavior (Prkachin & Harvey, 1988) and may simply live with the experience

of low control and thus remain focused on tasks. When a situation allows high perceived control, those high on Type A behavior should enjoy better performance and more job satisfaction than those low on Type A behavior because the need to reestablish control is not a distraction. Consequently, those high on Type A behavior should be more satisfied than those low on the behavior and their tendency to focus on tasks should result in strong feelings of self-efficacy, high performance goals, and high motivation to work on several projects at the same time. According to Taylor and her colleagues (1984), these mechanisms give those high on Type A behavior a performance advantage over others.

Second, according to Strube's (1987) self-appraisal model, people high on Type A behavior place a high value on the attainment and accurate assessment of success, productivity, and accomplishment. Compared to those low on Type A behavior, the former respond to situations that create uncertainty about their abilities with greater attempts to generate diagnostic information. Situations of low perceived control might inhibit them from generating information regarding their abilities or from making personal or internal attributions for what they accomplished. These situations thereby reduce levels of motivation and satisfaction for those high on Type A behavior. On the other hand, situations in which perceived control is high may facilitate their ability to generate information to confirm their task-related competencies and therefore increase their motivation and job satisfaction. In essence, those high on Type A behavior need some perceived control to assess whether they have achieved something, and the conclusion that they have done so promotes satisfaction and performance.

Additionally, literature reviews by Ganster (1986) and Ivancevich and Matteson (1988) have indirectly suggested the importance of perceived control in the relationship between Type A behavior and work-related outcomes. For example, those authors discussed research findings showing a positive association between Type A behavior and individual performance in academic settings, using both professors and students as subjects. However, results concerning this link in nonacademic organizations have been decidedly mixed (Ganster, 1986). It is possible that students and professors have higher perceived control over how they spend their time and the order in which they undertake tasks than people in other settings. This perception of control might reduce distraction and afford a good opportunity for those high on Type A behavior to verify their task-related competencies. As a result, they will be more satisfied and perform better in these settings than other individuals. These arguments suggest that

> *Hypothesis 1: Individuals exhibiting high levels of Type*
> *A behavior will perform better and be more satisfied with*
> *their jobs than individuals exhibiting low levels, espe-*
> *cially when the former perceive that they have a high*
> *level of control in their jobs.*

The relationship between Type A behavior and reported somatic symptoms is also of interest. Previous research has provided mixed support for

this relationship. Although some investigators (Carver, Coleman, & Glass, 1976; Carver, DeGregorio, & Gillis, 1981; Matthews & Carra, 1982) have found a negative relationship between Type A behavior and the reporting of negative physical symptoms, others have found a positive relationship between Type A behavior and the frequency and severity of reported symptoms of fatigue and tension (Mayes, Sime, & Ganster, 1984; Smith & Sheridan, 1983; Woods & Burns, 1984). The notion of perceived control may help resolve these conflicting findings. Perceived control may play a role in producing the negative stress impact found in those high on Type A behavior (Carver & Humphries, 1983; Glass, 1977). Strube (1987) proposed that such individuals will find uncertainty stressful. However, when people can locate or diagnose their ability levels, as they can when perceived control is high, individuals high on Type A behavior should experience less stress and physiological response than they will in situations of low perceived control. Further, the distracting quality of low-control situations ought to induce stress for those high on Type A behavior. Thus,

> *Hypothesis 2: Individuals exhibiting high levels of Type A behavior will report more somatic complaints than individuals exhibiting low levels, especially in situations in which perceived control is low.*

METHODS

Respondents and Procedures

The respondents for this study were employees of a variety of organizations in the northeastern United States. The first group consisted of 59 industrial hygienists who were members of the Delaware Valley Section of the American Industrial Hygienist Association. The second consisted of 71 internal auditors, members of the Philadelphia Chapter of the Institute of Internal Auditors, Inc. Members of these two associations received a copy of a questionnaire by mail with a cover letter written by the president of their association explaining the purpose of the survey and stating that their participation was voluntary. All respondents were assured of confidentiality and given self-addressed, stamped envelopes in which to mail their completed questionnaires to us. The response rate for the industrial hygienists was 24 percent, and for the internal auditors it was 25 percent.

The third group was 35 registered nurses attending an evening and weekend nursing program at a major university in the Northeast. Questionnaires and envelopes were distributed by instructors who explained the purpose of the study and stated that participation was voluntary and responses confidential. The response rate for this group was 35 percent. The fourth and last group consisted of all 18 full-time employees among the people attending a class offered by the senior author. These respondents were also assured of confidentiality and given self-addressed, stamped envelopes in which to mail their completed responses back to us. The combined response rate for the first three groups of respondents was 28 percent

and the response rate for the fourth group was 100 percent. The combined response rates for all respondents falls slightly below the 31 to 62 percent range found for previous mailed surveys cn Type A behavior (Boyd, 1984; Lee & Gillen, 1989; Matteson, Ivancevich, & Smith, 1984; Taylor et al., 1984). The heterogeneity of the 183 respondents' jobs and organizations was beneficial in that having data from only one organization can limit the generalizability of results and variance on predictor variables.

All respondents were also asked to give their supervisors a short (one-page) performance appraisal questionnaire to fill out; 91 supervisors returned completed questionnaires.

In the overall group, 60 percent were men and the mean age was 38.5 years. All respondents indicated that they had some graduate school training. The mean level of length of company tenure was 8.7 years, and the average tenure in the current division was 4.7 years.

Measures

The strength of the Type A behavior pattern was assessed with a modification of the Thurstone Temperament Schedule's Activity Subscale (TTS) (Thurstone, 1953). Carmelli, Rosenman, and Chesney (1987) reported that the TTS showed the greatest stability of a group of self-report measures of Type A behavior. Similarly, Mayes and colleagues (1984) argued that the TTS was more reliable, had stronger construct validity, and showed as good or better agreement with structured interviews than other self-report measures of Type A behavior. The TTS includes 20 items, such as "In conversation, do you often gesture with your hands and head?" and "Do you ordinarily work quickly and energetically?" The five-point response scale ranges from "definitely true" (5) to "definitely false" (1). Preliminary factor analyses of the TTS items failed to produce multiple factors. Ultimately, we summed all TTS items to form a composite Type A score to permit comparisons between our findings and previous research using the entire TTS. High scores on the TTS represent a high level of Type A behavior. The mean of 69.9 and standard deviation of 8.64 were comparable to those found in previous research (Byrne, Rosenman, Schiller, & Chesney, 1985; Mayes et al., 1984).

The measure of perceived control used here was a scale we used in previous work to measure powerlessness (Ashford, Lee, & Bobko, 1989). However, the content of the scale's three items directly reflects our definition of perceived control as the belief that a response that can influence an event's aversiveness is at hand. The items are: "I have enough power in this organization to control events that might affect my job," "I understand this organization well enough to be able to control things that affect me," and "In this organization, I can prevent negative things from affecting my work situation." For these items, 1 equaled "strongly disagree" and 5, "strongly agree."

Six items were used to assess an individual's general job performance. Examples are "How effective is this employee in his or her job?" (1 = not at all effective and 7 = extremely effective), "Please rate the quality of the work

this employee produces" (1 = low quality and 7 = high quality), and "Please rate the quantity of work this employee produces" (1 = low quantity and 7 = high quantity). We matched immediate supervisors' answers to particular respondents using code numbers.

Job satisfaction was assessed with five items from the general satisfaction scale of the Job Diagnostic Survey (JDS) (Hackman & Oldham, 1975). We measured somatic complaints using the ten-item scale developed and evaluated by Caplan, Cobb, French, Harrison, and Pinneau (1975), which asks respondents how frequently (never, once or twice, three times or more) they have been bothered by symptoms such as "heart beating hard," "dizzy spells," and "trouble sleeping" in the past month.

A final measurement concern was controlling for gender and age. Previous Type A research has focused on middle-aged, middle-class, employed American men. Price (1982) noted apparent gender differences in how people manifested specific Type A behaviors and characteristics, and Friedman and Rosenman (1974) suggested that Type A behavior increasingly manifests as people grow older. Therefore, we controlled for both gender and age in all the regression analyses conducted.

RESULTS

Table 1 shows the means, standard deviations, alphas, and intercorrelations of the variables used in this study. The extent of Type A behavior was positively related to performance ratings ($r = .25$, $p < .01$) but unrelated to job satisfaction ($r = -.02$, n.s.) and somatic complaints ($r = .07$, n.s.). Perceived control was unrelated to Type A behavior, performance, or somatic complaints, but it was positively related to job satisfaction ($r = .33$, $p < .01$). Since Type A behavior was unrelated to perceived control, the possibility that people high on Type A behavior perceived more control than those low on Type A behavior in the same situation cannot serve as an alternative explanation for the hypothesized results of this study.

To test perceived control's hypothesized moderating effect in the rela-

TABLE 1
Correlation Matrix for All Variables[a]

Variables	Means	s.d.	Correlations[b]				
			1	2	3	4	5
1. Performance	33.03	5.7	(.82)				
2. Job satisfaction	25.58	5.4	−.15	(.81)			
3. Somatic complaints	12.71	2.8	.06	−.23**	(.77)		
4. Type A behavior	69.92	8.6	.25**	−.02	.07	(.69)	
5. Perceived control	9.01	2.6	−.07	.33**	−.03	.02	(.83)

[a] N = 183, except for performance, which was based on the responses of 91 supervisors.
[b] Values in parentheses represent coefficient alphas.
* $p < .05$
** $p < .01$

tion of Type A behavior to performance, job satisfaction, and somatic complaints, we used hierarchical moderated regression analysis (Cohen & Cohen, 1975). In this type of analysis, a hypothesized moderator effect is supported if the interaction term significantly increases the variance explained by the predictors. To test perceived control's moderating effect in an equation with the supervisors' performance ratings as the dependent variable (model 1 in Table 2), we entered the demographic variables first, then Type A behavior, perceived control, and finally the interaction of Type A behavior and perceived control. Table 2 presents the results of these regression analyses.

Results indicate that the interaction of Type A behavior and perceived control was significantly related to performance (β = .26, ΔR^2 = .05, $p <$ .05), job satisfaction (β = .19, ΔR^2 = .03, $p < .05$), and somatic complaints (β = .19, ΔR^2 = .03, $p < .05$). Thus, all the interactions were statistically significant.

To further explore the direction of the moderating relations, we split the respondent group into those with high levels of perceived control and those with low levels, using the median value as the dividing point. We then correlated Type A behavior with performance, job satisfaction, and somatic complaints within subgroups. The results demonstrate that Type A behavior and performance were highly correlated when perceived control was high (r = .51, $p < .01$) but showed no relationship when perceived control was low (r = .01, n.s.). In addition, when perceived control was high, Type A behavior was positively related to job satisfaction (r = .15, $p < .10$) and somatic complaints (r = .15, $p < .10$). On the other hand, when perceived control was low, Type A behavior was negatively associated with job satis-

TABLE 2
Results of Regression Analyses

Variables	β	Overall R^2	ΔR^2
1. Performance			
Age and gender			.03
Type A behavior	.15		
Perceived control	−.13	.09	.06
Behavior × control	.26*	.14	.05*
2. Job satisfaction			
Age and gender			.04
Type A behavior	−.08		
Perceived control	.24**	.13	.09**
Behavior × control	.19*	.16	.03*
3. Somatic complaints			
Age and gender			.03
Type A behavior	−.01		
Perceived control	−.06	.04	.04
Behavior × control	.19*	.07	.03*

* $p < .05$
** $p < .01$

faction ($r = -.24$, $p < .05$) and somatic complaints ($r = -.10$, n.s.). We assessed the significance of the differences in these correlations using Fisher's r-to-z conversion for independent correlations (Cohen & Cohen, 1975: 50–52). All pairwise differences in correlations between the subgroups with high and low levels of perceived control were significantly different from zero ($p < .05$).

DISCUSSION

Support emerged for the hypothesized significance of the interaction with performance and job satisfaction in this study. Results of the moderated regression equations indicate that perceived control interacts with Type A behavior to facilitate high job performance and satisfaction: the performance of people high on Type A behavior is enhanced in situations in which they have a high degree of perceived control. The results further suggest that in order to motivate highly competitive, achievement-oriented Type A individuals, organizations and supervisors should consider taking steps to increase their perceived control. Such steps might include reducing role ambiguity and role conflict, participatively setting goals with these individuals, placing them in relatively autonomous jobs, and providing them with tasks in which they have a high degree of control over work scheduling and work methods. These types of interventions should increase both performance and job satisfaction. However, some of the effects found in this study were small. Given the correlational nature of this study and the interactive model used, future research should try to replicate these findings, preferably using longitudinal or field experiment designs.

When somatic complaints was the criterion, a significant interactive effect of perceived control again emerged. However, the weak but positive relationship between Type A behavior and somatic complaints when perceived control was high is somewhat perplexing. It may indicate that maintaining control is of paramount importance to Type A individuals (Glass, 1977), who may react strongly to their internal demands for maintaining control in their occupational environments by working harder, longer, and faster. Although such coping behaviors may result in high job performance ratings, there is a small probability that such individuals pay a price in somatic distress. Future studies should assess if the short-term somatic complaints reported depress long-term job performance and raise health risks.

The significance of the correlation ($r = .25$, $p < .01$) between Type A behavior and job performance regardless of perceived control levels also provides support for the notion that Type A individuals tend to perform better at work than others. Our finding replicates those of numerous studies conducted in laboratory and academic settings (Glass, 1977; Matthews et al., 1980; Ovcharchyn, Johnson, & Petzel, 1980; Taylor et al., 1984). However, field studies conducted by Lee and Gillen (1989) and by Matteson and colleagues (1984) on people selling consumer products and insurance failed to support the Type A behavior-job performance relationship. Ganster (1986)

suggested that job types may moderate that relationship. However, Ganster and Mayes (1988) did not find such a moderating effect. Although the number of organizations and sample size were rather small in that study, which is unpublished, we did not find any statistically significant moderating effect in the current data either.[2]

In sum, the results of this study suggest that people with high levels of Type A behavior and perceived control tend to be more productive, have higher job satisfaction, and report more somatic complaints than Type A people low in perceived control. Clearly, perceived control is a critical moderating variable in the study of Type A behavior in organizational settings. However, contrary to Spector's (1986) finding, perceived control itself was unrelated to performance in this study. It is possible that differences in the measures of perceived control account for the difference in findings. In Spector's meta-analytic review, measures designed to tap both autonomy and participative decision making were used as control indexes. The autonomy measures included came primarily from Hackman and Oldham's (1975) JDS and from Sims, Szilagyi, and Keller's (1976) Job Characteristics Inventory. Measures of participation were far less consistent across the studies reviewed, but some studies included Siegel and Ruh's (1973) and Vroom's (1959) measures. These measures did not directly assess perceived control as we have defined it, whereas our perceived control measure specifically reflected that definition.

Previous studies have focused on examining the need for control and coping behaviors of individuals high on Type A behavior in relatively short-term, well-controlled laboratory environments. This study, however, examined people working in a variety of organizational settings using outcome variables relevant to those settings. Ganster (1986) noted that the Type A construct is particularly interesting to organizational researchers when the laboratory can be generalized to a work environment in which time-based demands, competition for limited resources, and threats to internal control are predominant. This study provides an important initial look at how perceived context may interact with Type A behavior to affect important outcomes. Future studies should also examine the effects of perceived organizational environment on the health, career choices, career advancement, work accomplishment, and quality of life of people with high levels of Type A behavior.

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[2] The results of these analyses can be obtained from the senior author upon request.

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Academy of Management Journal
Volume 33

AUTHOR INDEX

TITLE INDEX

SUBJECT INDEX

The logic followed for this index was to put each entry under a broad category and then use subheadings for greater specificity. An example might be "Competition, intensity of," or "Performance, organizational." Statistical methods or research designs were indexed if the author(s) included a significant discussion of the technique. The population being studied was also indexed if it was an identifiable group. This included particular industries, types of organizations, nationalities, and occupations. *See* and *See also* are intended to refer the user to a different entry or to an additional entry.

N.G.D.

Resource:
  dependence, 45–63, 107–124
  sharing, 259–283
Return on assets, 673–688, 760–776. See
  also Profitability.
Return on equity, 116–124, 760–776. See
  also Profitability.
Return on invested capital, 245–255. See
  also Profitability.
Rewards, 188–198
Risk, 237–255, 756–776
  unsystematic, 520–533
Role, 847–857
  performance, 692–724
Sales, 673–688
Satisfaction:
  career, 395–405
  job, 871–878
  pay, 423–435
Self-confidence, 88–103
Service delivery systems, 478–498
Service organizations, 151–175
Sex. See Gender.
Size, organizational, 240–255, 452–472,
  508–516, 667–688
Slack resources, 454–472
Socialization, organizational, 847–858,
  860–869
Social responsibility, 239–255
Somatic complaints, 871–878
Stock control, 133–148
Stock price, 784–798

Strategic business units, 259–283
Strategy:
  business, 259–283, 725–752
    analyzers, 817–832
    defenders, 817–832
    prospectors, 817–832
  corporate, 291–305, 725–752
  decisions, 129–148
  group, 334–362
  individual, 88–103
  opportunities, 288–306
  threats, 288–306
Stress, 624–635, 859–869
Structure, geographic, 11–35, 458–472
Succession, executive, 11–35
Supermarket employees, 623–635
Supervisors, support from, 67–86
Task characteristics, 409–420, 664–688,
  704–724
Task design, 534–557
Teams, 334–362
Technology, 506–516
Tenure:
  job, 673–688
  organizational, 136–148, 673–688
Tobin's q, 524–530
Transfers, intrafirm, 578–599
Turnover rate, 179–186
Type A behavior pattern, 870–878
University administrators, 43, 50–63
Utility firms, 584–599
Ventures, new, 151–175

CALL FOR PAPERS

1991 National Academy of Management Meeting

Theme: International Dimensions of Management

August 11–14 1991
Miami Beach, Florida—Fontainebleau Hilton
4441 Collins Avenue, Miami Beach, FL 33140
Preconvention Activities: August 9–11, 1991

You are invited to submit an *original* paper, symposium, or proposal for other presentations *directly* to a Division or Interest Group Chairperson listed inside.

SUBMISSION RULES

To be considered, your submission MUST adhere to the following rules:

1. Submissions must be entirely original and *must not* be under concurrent consideration or scheduled for presentation elsewhere. Further, they must not have been previously accepted for publication in a journal. Violation of this rule is a serious breach of professional ethics.

2. No participant is allowed to be included as an author or other participant nor in any other role as presenter, session chair, discussant, etc. IN MORE THAN *3 submissions or sessions* for the REGULAR program. This rule does not apply to preconvention activities and meetings, nor to program listings resulting from officer roles.

3. Papers should be no more than 21 total pages *including* title page, abstract page, text, exhibits (figures, graphs, and tables), footnotes, and references. The references and format should follow the Style Guide for the *Academy of Management Journal* (pp. 210–215 in the March 1990 issue). Electronic submissions will not be accepted.

4. Papers to be presented will be selected by blind review procedures. Please word your paper so that only the title page reveals authors' names and affiliations. The title page should also show complete addresses and phone numbers of all authors and specify who will present the paper. The intended division or interest group should be listed at the bottom of the title page.

5. Symposium or other proposals must include a 3–5 page overview statement, a 2–5 page synopsis of each presentation, and a *signed statement* from each intended participant showing agreement to participate.

6. A separate abstract page for each paper, symposium, etc., should include the title and an abstract *no longer than 50 words,* but *should not* report the authors' names.

7. Submissions should be prepared in letter-quality elite type and be double-spaced on 8.5 by 11 inch paper. Use margins of 1 inch on every side. Maximum page lengths specified above are based on elite (12 characters per inch) type.

8. Four copies of the submission plus one additional copy of the title page and the abstract page must be submitted.

9. Submissions should be sent directly to a Division or Interest Group Chairperson listed in this Call. Papers should be submitted to a *single* program Chairperson. In the special case of a proposed joint symposium or other presentation intended to be sponsored by two or more divisions or interest groups, the items listed in #8 above should be sent to *all* relevant Program Chairpersons, with a cover letter identifying the submission as a joint symposium or other proposal.

10. Except for submissions across national borders, all submissions *must* be accompanied by a self-addressed, stamped legal size envelope to be used in returning Program Committee decisions. Submissions across national borders must be accompanied by a self-addressed post card and a self-addressed legal size envelope, but these need not be stamped (though it would be helpful if they are).

11. Submissions will be judged primarily on the three criteria listed below and secondarily on relevance to the overall theme of the meeting. However, papers should also be pertinent to the domain of the division or interst group to which they are submitted.

12. THE DEADLINE FOR RECEIPT OF SUBMISSIONS IS JANUARY 7, 1991.

SUBMISSION REVIEW AND FEEDBACK

Submissions will be reviewed by Program Committees within the professional divisions or interest groups on the basis of: (1) original contribution, (2) overall quality, and (3) interest to Academy members. Reviewers' comments will be provided to authors when they are notified of individual Program Committee decisions.

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All program participants must register for the conference. Participants must personally present their submissions; there can be no no-shows. The Academy does not pay travel to or from the meeting for program participants, nor any other expenses.

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Only a select group of papers, as judged by the Program Committees, will be published in the *Proceedings*. Papers accepted for publication in the *Proceedings* may need to be shortened to fit within page allotments. All other papers selected for presentation will be represented by an abstract of no more than 50 words. Symposia, etc., are not included in the *Proceedings*. Specifications regarding style will be supplied later to authors by the *Proceedings* co-editors, Larry Jauch and Jerry Wall. The *Proceedings* will be published by photo-offset process, with camera-ready copy prepared by the authors.

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PROFESSIONAL DIVISION AND INTEREST GROUP DOMAIN STATEMENTS

DIVISIONS

Business Policy and Planning. Specific domain: the roles and problems of general managers—those who manage multibusiness firms or multifunctional business units. Major topics include: strategic formulation and implementation; strategic planning and decision processes; strategic control and reward systems; resource allocation; diversification and portfolio strategies; competitive strategy; selection and behavior of general managers; and the composition and processes of top management teams.

Careers. Specific domain: people's lifelong succession of work experiences, the structure of opportunity to work, and the relationship between careers and other aspects of life. Major topics include: individual career development; career management strategies; career planning; relationships between human resource systems and careers; lifecycle interactions with work; race, culture, and gender effects on careers; labor force diversity; internal labor market structures and functions; cross-cultural careers; and effects of demographic and social changes on work.

Entrepreneurship. Specific domain: the creation and management of new businesses, small businesses and family businesses, and the characteristics and special problems of entrepreneurs. Major topics include: new venture ideas and strategies; ecological influences on venture creation and demise; the acquisition and management of venture capital and venture teams; self-employment; the owner-manager; and the relationship between entrepreneurship and economic development.

.**Health Care Administration.** Specific domain: the health care industry. Major topics include: performance of health care workers and organizations; public policy issues, such as access to care, competition, rate setting, and prospective reimbursement, and their implications for managing health care organizations; health care finance and marketing; and empirical or conceptual application of theory in health care organizations, even on topics which might also fall within another division's domains.

International Management. Specific domain: content pertaining to theory, research, and practice with an international or cross-cultural dimension. Major topics include: investigations of similarities and differences in organizational and management practices in different countries; appropriate organizational structures for facilitating parent-subsidiary interaction in multinational companies; and papers with an international dimension, even on topics which fall within some other division's domain.

Management Education and Development. Specific domain: the study of the organization and delivery of management education (academic) and management development (non-credit instruction). Major topics include:

theoretical advances or empirical evidence about effective and innovative instructional methods or technology; applications of learning theories; and evaluation studies of the effectiveness of management education and development techniques.

Management History. Specific domain: the historical development of management concepts and practices and the historical roles of individual managers. Major topics include: historical assessments of the social consequences of management; reexaminations of established historical concepts; the historical role of the behavioral sciences in the emergence of management practices; historical development of present-day companies; historical analyses of management philosophy; ways of using historical materials; new directions in historical research and oral history; the importance of a historical perspective in international management; historical aspects of quality control, cultures, and health and safety in the workplace; and topics which, although they may appear to fall within some other division's domain, draw on historical data that are firmly rooted in a historical perspective.

Managerial Consultation. Specific domain: content relating directly to management consulting and to the interface between consulting and academic activities. Major topics include: the consulting industry; the management of consulting firms; marketing of consulting; skills and roles of consultants; training and evaluation of consultants; the consulting process; ethical issues in consulting; and the participation of academics as consultants, including the role consulting should and does play in an academic career.

Organization and Management Theory. Specific domain: the study of organizations and their management on several levels of analysis—organizational births and deaths, and the impact of social, economic, and political forces at the population level; organization design and redesign, culture, and adaptation processes at the organization level; management behaviors, strategies, and demographics at a collective managerial level—and the relationship of all of these and other factors to outcomes at these three levels.

Organization Development and Change. Specific domain: the development of theory and innovative practice relevant to organization change. Major topics include: change processes within organizations, with or without assistance by change agents; active attempts to intervene in organizations to improve their effectiveness, and scholarly studies of such interventions; the roles of change agents; and problems of self-awareness, responsibility, and the political consequences of OD theory and practice.

Organizational Behavior. Specific domain: the study of individuals and groups within an organizational context, and the study of internal processes and practices as they affect individuals and groups. Major topics include: individual characteristics such as beliefs, values, and personality; individual processes such as perception, motivation, decision making, judgment, com-

mitment, and control; group characteristics such as size, composition, and structural properties; group processes such as decision making and leadership; organizational processes and practices such as goal setting, appraisal, feedback, rewards, and behavioral aspects of task design; and the influence of all of these on such individual, group, and organizational outcomes as performance, turnover, absenteeism, and stress.

Organizational Communication and Information Systems. Specific domain: the study of behavioral and social aspects of communication and information systems within and between organizations. Major topics include: interpersonal communication; verbal, nonverbal, and electronic communication; vertical, horizontal and diagonal communication; executive information systems; intergroup and intragroup communication; DSS and GDSS; communication networks; organizational adoption of communication and information technology; communication and information strategy and policy; communication and organizational culture; communication and information research methodology; and managing information systems.

Personnel/Human Resources. Specific domain: content relating to administering the Personnel/HR office, and to external influences upon the administration of work activity. Major topics include: recruitment, selection, testing, and staffing; HR planning and forecasting; HR employee relations and information systems; design of policies and procedures; health and safety programs; job analysis and pay determination; compensation procedures, including benefits and services; design of performance appraisal systems, forms and procedures; methods by which P/HR programs are developed, adopted, implemented, and evaluated; the role and experiences of P/HR managers; the impact of the P/HR office on such outcomes as performance, motivation, attendance, turnover, occupational health, and safety; such external influences upon work activity as unionization, collective bargaining, industry councils, and other forms of formal employee participation; labor force participation rates and the supply of labor; and the impact of legislative, economic, and political developments relevant to administering P/HR programs, including labor legislation, EEO/Affirmative Action legislation, court rulings, and regulatory agency guidelines.

Production/Operations Management. Specific domain: the design, operation, and control of production systems in both manufacturing and service organizations. Major topics include: capacity planning; production and inventory control; facility location and layout; operations strategy; just-in-time production systems; computer-based production information systems; computer-integrated manufacturing; and the management of process technologies.

Public Sector. Specific domain: public and not-for-profit management, public policy making, and governmental decision-making, and other areas of research concerned with government, not-for-profit, and voluntary organizations. Major topics include: public organization theory and behavior; pub-

lic personnel management; public-private differences; leadership, decision-making, and strategic management in public and not-for-profit organizations; public-private partnerships; studies of public policy content and process; and research related to the diverse set of organizations whose primary outputs have a "public goods" character.

Research Methods. Specific domain: quantitative and qualitative research methodologies, theory building and development, and the history and philosophy of science. Major topics include: transferability of research methods to other countries, languages, cultures, firms, etc.; ethnography, observation, multi-method, and other research processes; research and analytical methods used in other disciplines, and their applicability to organizational studies; research design and measurement; construct validation; and data analytical procedures.

Social Issues in Management. Specific domain: corporate social responsibility, business ethics, corporate social performance, and policy. Major topics include: the public affairs function of business; stakeholder analysis and management; interest group activities; corporate governance; managerial values and ethics; corporate crime; corporate political action; the legal and the regulatory environment of business; social, ethical, and political issues affecting business; international and comparative aspects of business and society.

Technology and Innovation Management. Specific domain: organizational innovation, research and development, and the management of technology-based organizations. Major topics include: studies of the innovation process, including innovation diffusion and the development, implementation, and use of technological innovations such as office automation; organizational processes by which technically-oriented activities are integrated into organizations; behaviors and characteristics of scientists, engineers, and other technical professionals; technological forecasting and policies; the flow of technical knowledge; research project organization and management, and the behavior of project teams; and studies of scientific and engineering-based organizations, industrial R&D laboratories, and research units in other professional organizations, even on topics falling within some other division's domain.

Women in Management. Specific domain: theory, empirical research, and management practice relevant to women and gender issues in organizations. Major topics include: similarities and differences between men and women in work-related attitudes, behaviors, experiences, and outcomes; research about the context and sources of any such differences; studies of issues particularly relevant to working women, such as dual careers, child care, tokenism, sexual issues at work, and job interruptions; and studies whose central contribution is in describing or understanding gender-related issues, even on topics falling within some other division's domain.

INTEREST GROUPS

Managerial and Organizational Cognition. Specific domain: the study of how organization members model reality and how such models interact with behaviors. Major topics include: attention, attribution, decision making, ideology, information processing, learning, memory, mental representations and images, perceptual and interpretive process, social construction, and symbols.

Power, Negotiation, and Conflict Management. Specific domain: the study of power and influence (as opposed to formal authority) and all aspects of conflict and conflict management. Major topics include: coalitions; persuasion in task force and other group settings; cooperation and competition; negotiation; third party intervention; procedural justice; and dispute resolution.

PROFESSIONAL DIVISION AND INTEREST GROUP
SPECIAL INSTRUCTIONS
DIVISIONS

Business Policy and Planning. An award will be given to the best competitive paper.

Entrepreneurship. Empirical and conceptual papers, symposia, and workshops are invited. Topics of special interest include new ventures, the social consequences of entrepreneurship, the owner-manager, family business, corporate entrepreneurship, international entrepreneurship, and entrepreneurial education. A best paper award will be presented.

Health Care Administration. An award of $500, sponsored by the American College of Health Care Executives, will be given for the best paper submitted. The division also offers an award of $250 for the outstanding paper based on a dissertation; papers to be considered for this award should be clearly identified as such at the time of submission.

Management Education and Development. The division offers two $500 externally sponsored awards for the best papers in management education (one award) and management development (one award). An additional $500 award will be offered for the best research proposal that promotes the rigorous and integrative study in the field of management education and development. The award is open to all members of the Academy and will be jointly administered by the award's sponsor, the Newport News Shipbuilding Company, and the Management Education and Development Division.

Management History. An award of rare books is given for the best competitive paper.

Managerial Consultation. Empirical and conceptual papers that integrate the Academy's various divisions and interest groups with the consultation process are invited. Externally sponsored awards are available for a meritorious theoretical paper and for a meritorious applied paper appearing on the Managerial Consultation Division's program.

Organization and Management Theory. Two $500 recognition awards will be given: one for the best competitive paper (which may be co-authored) and one for the best competitive paper from a dissertation (which may not be co-authored). The dissertation paper should be clearly identified as such at the time of submission.

Organization Development and Change. An award will be presented for the best competitive paper. One session will be devoted to papers that explore emerging concepts in organization development. Papers submitted that fit that category should be labeled as such. They will be blind reviewed as a separate batch.

Organizational Behavior. Two recognition awards will be given: one for the best competitive paper (may be co-authored) and one for the best competitive paper based on a dissertation (must not be co-authored), which should be clearly identified as dissertation-based at the time of submission.

Organizational Communication and Information Systems. Awards will be presented for competitive papers to recognize the scholarship of participants.

Personnel/Human Resources. An award will be given to the best competitive paper (the paper may be co-authored) presented at the annual meeting. In addition, a $500 cash award will be given to the best student paper (the paper may be co-authored, but *the student must be the first author*). Note that in order to be considered for the best student paper award, the paper must be clearly identified as a student paper at the time of submission.

Women in Management. The Dorothy Harlow Distinguished Paper Award of $500 will be presented to the best competitive paper. The division encourages submissions dealing with theory and methods of studying gender issues in organizations, the impact of gender and other kinds of organizational diversity, and submissions relevant to this year's theme: international dimensions of management.

INTEREST GROUP

Power, Negotiation, and Conflict Management. An award will be given for the best competitive paper.

REMINDER:
DEADLINE FOR RECEIPT OF ALL SUBMISSIONS IS
JANUARY 7, 1991.

THE ACADEMY OF MANAGEMENT
CODE OF ETHICAL CONDUCT

CREDO

We believe in discovering, sharing, and applying managerial knowledge.

PREAMBLE

Our professional goals are to enhance the learning of students, colleagues, and others and to improve the effectiveness of organizations through our teaching, research, and practice of management. We have five major responsibilities:

● To our students—Relationships with students require respect, fairness, and caring, along with recognition of our commitment to the subject matter and to teaching excellence.
● To managerial knowledge—Prudence in research design, human subject use, confidentiality, result reporting, and proper attribution of work is a necessity.
● To the Academy of Management and the larger professional environment—Support of the Academy's mission and objectives, service to the Academy and our institutions, and the recognition of the dignity and personal worth of colleagues is required.
● To both managers and the practice of management—Exchange of ideas and information between the academic and organizational communities is essential.
● To all people with whom we live and work in the world community—Sensitivity to other people, to diverse cultures, to the needs of the poor and disadvantaged, to ethical issues, and to newly emerging ethical dilemmas is required.

STUDENT RELATIONSHIPS

In our roles as educators, the central principles that underlie appropriate student-educator relationships are professionalism, respect, fairness, and concern.

Striving for teaching excellence. It is the duty of Academy members who are educators to prepare themselves carefully. Maintenance of *current knowledge* in the field requires a broad understanding of management theo-

ries, research and practice, and use of current classroom materials. Educators should have or develop expertise in the areas in which they teach. *Effective teaching* requires sufficient time allocated to preparation, clear classroom communication, timely grading, and a willingness to provide an explanation of a student's grade. Educators should act as role models in their relationships. They should also sensitize students to the ethical dimensions of management. In addition, educators have an obligation to present material without conscious bias and to make their own relevant biases known to their students. Educators should attempt to evaluate their teaching through some appropriate *outcome assessment* method which goes beyond concept retention.

Showing respect for students. It is the duty of Academy members who are educators to show appropriate respect for student feelings, interests, needs, contributions, and intellectual freedom. Students' *right to privacy* requires maintaining the confidentiality of academic records and private communications, unless disclosure is mandated by law, institutional policy, or morally compelling purpose. Educators must *avoid manipulation, coercion, or exploitation* of students (especially acts directed at securing monetary, ego, or sexual gratification) and should demonstrate a sensitivity to cultural and personal diversity by avoiding racial, sexual, religious, and ethnic discrimination.

Maintenance of objectivity and fairness. It is the duty of Academy members who are educators to treat students equitably. *Fair treatment of students* requires explaining and adhering to academic requirements and standards. Any subsequent change in these requirements or standards, either of the institution or in an individual course, should appropriately recognize the impact on students. *Impartiality, objectivity, and fairness* are required in all dealings with students. Examinations should be carefully prepared and written work graded in an impartial manner. Educators should scrupulously avoid entering any overly personal relationship or accepting any gift or favor which might influence, or appear to influence, an objective evaluation of a student's work. *Appropriate evaluation* of student performance requires test design, assignments, and testing conditions which minimize the possibility of academic misconduct. It is the educator's responsibility to pursue appropriate disciplinary action.

Counseling of students. It is the duty of Academy members to be helpful and sensitive in counseling students. When serving as *academic advisors,* members must be knowledgeable about academic requirements and should communicate these clearly and fully to advisees. Educators may play critical roles in a variety of *counseling situations.* This requires careful analysis of the student and situation and calls for special expertise and competence. Counseling advice should be identified as an expression of the member's own opinion. *Letters of recommendation* require candor and fairness. Members should not make insupportable statements nor fail to disclose material facts.

ADVANCEMENT OF MANAGERIAL KNOWLEDGE

Academy member research should be done honestly, have a clear purpose, show respect for the rights of all individuals and organizations, efficiently use resources, and advance knowledge in the field.

Conducting and reporting. It is the duty of Academy members conducting research to design, implement, analyze, report, and present their findings rigorously. *Research rigor* includes careful design, execution, analysis, interpretation of results, and retention of data. *Presentation* of research should fairly represent the relevant literature and should include a treatment of the data that is honest and that reveals both strengths and weaknesses of findings. When important alternate hypotheses or explanations exist, they should be noted and data that disconfirm hypotheses should be acknowledged. *Authorship and credit* should be shared in correct proportion to the various parties' contributions. Whether published or not, ideas or concepts derived from others should be acknowledged, as should advice and assistance received. Many management-related journals have policies prohibiting or restricting potential articles from being reviewed concurrently in other outlets. These policies should be closely observed or there should be explicit discussion with the relevant journal editors concerning the intended *multiple submissions*. More than one report of essentially the same data and results should not be published unless the reports are explicitly directed to different audiences through different types of outlets. When several separate but *related reports* result from a single study, the existence of the different reports should be made known to the relevant journal editors and the reports should reference each other. *Reviewer comments* should be considered thoughtfully before a manuscript is submitted to a different journal.

Participants. It is the duty of Academy members to preserve and protect the privacy, dignity, well-being, and freedom of research participants. This requires both careful research design and informed consent from all participants. *Risks and the possibility of harm* to research participants must be carefully considered and, to the extent possible, be minimized. When there is a degree of risk or potential harm inherent in the research, potential participants—organizations as well as individuals—must be informed. *Informed consent* means explaining to potential participants the purposes and nature of the research so they can freely choose whether or not to become involved. Such explanations include warning of possible harm and providing explicit opportunities to refuse to participate and to terminate participation at any time. Because students and employees are particularly subject to possible coercion, even when unintended, special care must be taken in obtaining their informed consent. *Third-party review* is one means of protecting the interests of research participants. Research plans involving human participants should be reviewed by an appropriate third party, such as a university human subjects committee or a focus group of potential participants. *Confidentiality and/or anonymity* questions must be resolved be-

tween researcher and potential research participants, both individuals and organizations, and when requested must be honored. Deception should be minimized and, when necessary, the degree and effects must be mitigated as much as possible. Researchers should carefully weigh the gains achieved against the cost in human dignity. To the extent that concealment and/or deception is necessary, the researcher must provide a full and accurate explanation to participants at the conclusion of the study, including counseling, if appropriate.

Dissemination. It is the duty of journal editors and reviewers to exercise their position of privilege in a confidential, unbiased, prompt, constructive, and sensitive manner. They have a duty to judge manuscripts only on their scholarly merits. *Conflicts of interest* may arise when a reviewer is in basic disagreement with the research approach or the line of research represented by a manuscript. In such cases, a reviewer should consult with the journal editor to decide whether to accept or decline to review the manuscript. *Protecting intellectual property* is a responsibility of the reviewer and the editor. The content of a manuscript is the property of its author(s). It is therefore inappropriate to use ideas or show another person a manuscript one has been asked to review, without the explicit permission of its author, obtained through the journal editor. Advice regarding specific, limited aspects of the manuscript may be sought from qualified colleagues so long as the author's intellectual property remains secure. *Sharing of reviewing responsibilities* is inappropriate. The review is the sole responsibility of the person to whom it was assigned by the journal editor. In particular, students and colleagues should not be asked to prepare reviews unless the journal's editor has given explicit approval. Anyone contributing to a review should receive formal recognition. *Constructive review* means providing critiques and comments in a spirit of collegiality with thoroughness, timeliness, compassion, and respect, and in ways intended to improve the quality of the manuscript.

Grants and contracts. It is the duty of Academy members to accurately represent themselves and their proposed projects and to manage those projects as promised. *Representation* means accurate disclosure of one's level of expertise and expected actual involvement, the outcomes that can be reasonably expected, the realistic funding level needed, and potential conflicts of interest. *Grant and contract management* requires independence and objectivity such that one does not compromise one's responsibilities or create conflicts of interest. One must also manage time and budget responsibly and use the funds as promised unless permission is explicitly granted to do otherwise.

THE ACADEMY OF MANAGEMENT AND THE LARGER PROFESSIONAL ENVIRONMENT

The Mission Statement of the Academy describes member benefits and professional opportunities which impose corresponding duties and service responsibilities.

Sharing and dissemination of information. To encourage meaningful exchange, Academy members should foster a climate of free interchange and constructive criticism within the Academy and be willing to share research findings and insights fully with other members.

Academy participation. The Academy is a voluntary association whose existence and operations are dependent on cooperation, involvement, and leadership from its members. Members should abide by the Constitution, By Laws, policies, and codes of the Academy. Members should consider offering their time and talent to carry out activities necessary to maintain the Academy and its functions. Officers and members should fulfill their Academy *obligations and responsibilities* in a timely, diligent, and sensitive manner, without regard to friendships or personal gain. Members should honor all *professional meeting commitments* including presentation of accepted papers and participation in scheduled roles as chair, discussant, or panel members. Where absence from scheduled meeting responsibilities is unavoidable, members must contact appropriate individuals and pursue suitable alternative arrangements. One should consider the *impact* one's projects or activities may have on the integrity or reputation of the Academy and not engage in those which may have possible negative implications. Members should not imply that their work is sanctioned by the Academy unless an appropriate Academy body has specifically done so.

Commitment to professional standards of conduct. By this Code, the Academy provides ongoing ethical guidance for its members. Members should work to *raise membership consciousness* concerning ethical responsibilities and encourage acceptance of these responsibilities. Members should *notify* appropriate Academy officers or committees of the practices or actions of members which they feel may violate Academy regulations or general standards of ethical conduct. In this manner, the aspirational and educational goals of this code are served through discussion of the ethical dilemmas and values of our profession.

Strengthening and renewal of the Academy. The Academy of Management must have continuous infusions of people and new points of view to remain viable and relevant as a professional association. Members may contribute to this infusion by encouraging participation in the Academy by all eligible individuals, and by assisting new and prospective members to develop their skills and knowledge, and their understanding of their professional obligations.

The professional environment for many Academy members includes the university community. The central values which underlie appropriate university participation are understanding, involvement, respect, fairness, and the pursuit of knowledge.

Participation in university leadership. Professors should take an active interest in university governance. Professors should be *aware* of university policies that affect the dissemination of knowledge and be involved in the development of such policies. Professors should endeavor to positively in-

fluence policies relating to the quality of education and service to students. Active *organizational involvement* requires exercise of personal voting rights and respect for such rights of others, without regard to rank or tenure. Professors should *evaluate colleagues* for purposes of promotion and/or tenure on the basis of appropriate Academic criteria fairly weighted in accordance with standards understood by the faculty and communicated to the subject of the evaluation. It is the duty of Academy members to treat their colleagues with respect and fairness. Members should safeguard confidential *personal matters* and avoid disclosing opinions expressed, attribution of statements, voting behavior, and outcomes. Members should *address misunderstandings* and conflicts with those directly involved and avoid speculative criticism that might damage the reputations of individuals or groups. When speaking or *acting outside their university role*, professors should avoid creating the impression that they are speaking or acting for their university and/or its administration. Professors should dispose of *complimentary books* requested from publishers by a manner other than sale.

All Academy members, whether affiliated with a university, business, governmental, service, or consulting organization have an obligation to interact with others in a professional manner.

Membership in the professional community. It is the duty of Academy members to interact with others in our community in a manner that recognizes individual dignity and merit. The responsible professional promotes and protects *the rights of individuals* without regard to race, color, religion, national origin, handicap, sex, sexual orientation, age, political beliefs, or academic ideology, and refrains from sexual harassment. In the spirit of intellectual inquiry, the professional should *welcome suggestions* and complaints openly without reprisal. Members should ensure that *outside activities* do not significantly diminish their availability and energy to meet their institutional obligations.

MANAGERS AND THE PRACTICE OF MANAGEMENT

Consulting with client organizations ("clients") has the potential for enriching the teaching and practice of management, for translating theory into practice, and for furthering research and community service. To maximize such potential benefits, it is essential that members who consult be guided by the ideals of competence, integrity, and objectivity.

Credentials and capabilities. It is the duty of consultants to represent their credentials and capabilities in an accurate and objective manner. Consultants shall accept only those assignments for which they have *appropriate expertise*. Consultants shall refrain from exaggerating their professional qualifications to secure prospective assignments. Consultants shall examine any factors (e.g., prior experience, capabilities, other commitments) that might limit their judgment or objectivity in carrying out an assignment. *University endorsement* of the consulting activities of Academy members

employed by academic institutions should not be represented or implied to potential clients unless the assignment is formally under university sponsorship or is so approved.

Obligations to clients. Consultants have a duty to fulfill their obligations to their present and prospective clients in a professionally responsible and timely manner. Consultants shall place the highest possible priority on their *clients' interests.* Consultants shall avoid or withdraw from situations in which their clients' interests come into serious conflict with their own. Consultants shall not serve two or more *competing clients* without the consent of all parties. Consultants shall *fully inform* their clients. This means presenting results and/or advice in an unbiased manner, and discussing fully with the client the values, risks, and limitations of the recommendations.

Client relations. Consultants must fulfill duties of confidentiality and efficiency as part of the relationship with their clients. Consultants shall maintain *confidentiality* with respect to their clients' identities and the assignments undertaken unless granted permission by the client. Consultants should exercise concern for the protection of client employees and other stakeholders by maintaining, in particular, appropriate confidentiality. Consultants shall not take *personal or financial advantage* of confidential information acquired as a result of their professional relationships, nor shall they provide the basis upon which others may take such advantage. Consultants should meet their time *commitments* and conserve the resources utilized.

Remuneration. It is the duty of consultants to negotiate clear and mutually accepted remuneration agreements for their services. Consultants shall provide a *realistic estimate* of the fees to be charged in advance of assignments. Fees charged shall be commensurate with the services performed.

Societal responsibilities. Consultants have a duty to uphold the legal and moral obligations of the society in which they function. Consultants should report to the appropriate authorities any *unlawful activities* that may have been uncovered during the course of engagements (except where one's functional professional code directs otherwise).

Students and employees. It is the duty of the consultant to safeguard student and employee rights when they are involved in consulting assignments. Consultants may *involve students* in work generated by engagements, especially if such work possesses learning potential, but students must not be coerced into participation. When they are so involved, students, as well as employees, should be fairly compensated and be made aware of the nature of the work they are doing.

THE WORLD COMMUNITY

As citizens of the world community, Academy members may have much to contribute in shaping global consciousness by their teaching, research, and service.

World view. Academy members have a duty to consider their responsi-

bilities to the world community. In their role as *educators*, members of the Academy can play a vital role in encouraging a broader horizon for decision making, viewing issues from a multiplicity of perspectives, including those of the least advantaged. As *researchers*, members of the Academy should consider, where appropriate, increasing their exposure to other cultures via travel, study, and research. Where appropriate, research might highlight the responsible stewardship of the Earth's resources. In addition, members should take as a challenge the ongoing task of identifying evolving ethical issues by listening to those whose welfare is affected and by exploring the interaction of people and technology. In fulfilling their *service* responsibilities, members of the Academy should consider how they might lend their time and talent to enhance the world community through involvement in uncompensated public service.

Managing Human Resources, Second Edition
Wendell L. French, University of Washington

Small Business Management: A Guide to Entrepreneurship
Fourth Edition
Nicholas C. Siropolis, Cuyahoga Community College

Contemporary Government and Business Relations
Fourth Edition
Martin C. Schnitzer, Virginia Polytechnic Institute and State University

Management, Third Edition
Ricky W. Griffin, Texas A&M University

Business, Second Edition
Robert Kreitner, Arizona State University
Barry L. Reece, Virginia Polytechnic Institute and State University
James P. O'Grady, St. Louis Community College at Florissant Valley

Human Resource Management
Cynthia D. Fisher, University of Baltimore
Lyle F. Schoenfeldt, Texas A&M University
James B. Shaw, University of Baltimore

Strategic Management Theory: An Integrated Approach
Charles W. L. Hill, University of Washington
Gareth R. Jones, Texas A&M University

Also by Hill and Jones
Strategic Management: An Integrated Approach

Business Statistics: For Management and Economics
Fifth Edition
Wayne W. Daniel, Georgia State University
James C. Terrell

Also by Daniel
Essentials of Business Statistics, Second Edition

Management, Fourth Edition
Robert Kreitner

Business
O.C. Ferrell and Geoffrey Hirt

Houghton Mifflin